


GOOD HEALTH

ORAL HEALTH



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Prevention

THE greatest service rendered the Public by Health Officers is that of a preventive character. No health work is more important than the education of the citizen to the value of prevention and his training in the application of these principles to daily life.

In disease prevention, the first thought should be given to the mouth. The Oral Cavity frequently harbors foci of infection that prove to be most disastrous in systemic as well as local results. As a preventive measure the mouth should be maintained in a condition of health and cleanliness that it may perform its normal functions in a physiological manner.



Nine central figures, from left to right, front row sitting—Dr. Harold Clark, Toronto; Dr. W. D. Tracy, New York; Lt.-Col. G. G. Hume, Toronto; Dr. Leroy S. Miner, Boston; Dr. Arthur E. Smith, Chicago; Major W. E. Cummer, Toronto; Dr. J. W. Beach, Buffalo; Col. W. B. Clayton, Ottawa; Dr. F. J. Conboy, Toronto.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, JANUARY, 1919

No. 1

War Prosthesis of the Allies*

CANADIAN SESSION COMBINED N.D.A. AND C.D.A.
AT CHICAGO, AUGUST 4 TO 9, 1918.

BY MAJOR W. E. CUMMER, CANADIAN ARMY DENTAL CORPS.

UPON the evening of August the eighth, the place, The Auditorium, one of Chicago's largest theatres, and the occasion, the Canadian evening of the combined National Dental Association, and of our own Canadian Dental Association, one might safely say that an event in the history of Canadian dentistry occurred upon the soil and through the hospitality of our splendid brothers and allies of the South.

To those present on that occasion fell the rare privilege to listen to perhaps the first address upon the subject of the Dentistry of War Injuries, heard in America—the birth of a new and epoch-making branch of dentistry in which the members of our profession have wrought transformations of wounded men little short of amazing; and which calls forth from those practising this branch of dentistry knowledge and skill, daring and resource of the highest character. Through the action of the Canadian Government Lieut.-Col. Guy G. Hume, who, previous to his enlistment with the Canadian Army Dental Corps, occupied a position at the very front of his specialized pro-

*The writer wishes to afford acknowledgment to "La Restauration Maxillo-Faciale," Ash's Journal, Les Fractures Mandibulaires Post-elevateurs, Villian, Injuries of Face and Jaws, Martinier & Lemere (Whale), and to the bound proceedings of the Congres Dentaire Interallies, in addition to notes taken from lectures. It is interesting to note that at the Chicago meeting that the material on War Prosthesis was given by two officers of that great Congress, Lieut.-Col. Hume as one of the vice-presidents, and Major Villian as secretary-general.

fession, that of orthodontia, and who fills the chair of orthodontia in the Royal College of Dental Surgeons of Ontario at Toronto; and through the action of the Government of France at the co-instance of M. Justin Godart, Under Secretary of the Department of Health of France, and of President Joseph Nolin (of the C.D.A.), Major Georges Villian, who in civilian life stands at the very head of his profession and conducts a specialized practice in the city of Paris, France, and in addition fills the chair of dental prosthesis in Ecole Dentaire at Paris, France:—These gentlemen crossed the Atlantic

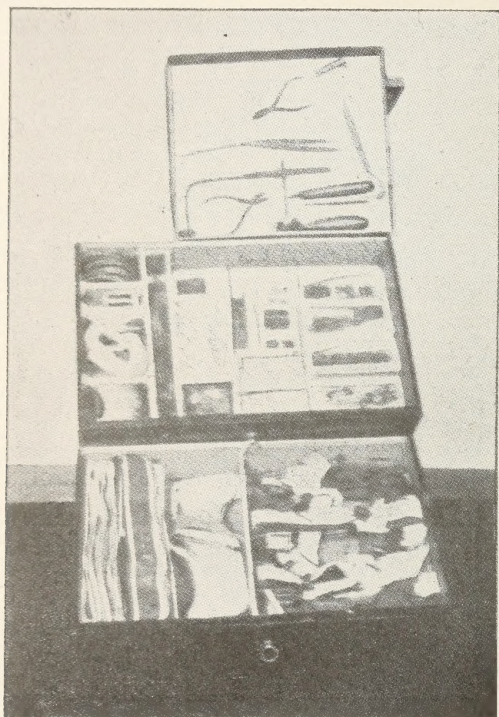


Fig. 1 Shows First Aid Box containing various items as listed in text.

and half the Continent and held their audience in a state of absorbed wonder-interest, and with slides, charts and casts show the marvelous results which they and those associated with them have secured for the wounded of France, Britain and Canada.

To another pen falls the task of reporting the magnificent work of Lieut.-Col. Hume, and to the writer falls the responsibility for the readers of Oral Health to undertake to set upon paper (so far as may be) the wonderful work as presented by Major Villian, a task in which the writer feels keenly his limitations, in view of the magni-

tude of the work as evolved and carried on in France. In addition to the address delivered before the Chicago meeting, Major Villian and President Nolin, with courtesy and unselfishness characteristic of their noble race, visited Toronto, and Major Villian held a mixed civilian and military gathering, over which Lieut.-Col. W. G. Thompson, A.D.D.S., M.D., No. 2, presided, in a state of breathless interest for upwards of three hours.

Major Villian commenced his lectures by an interesting description

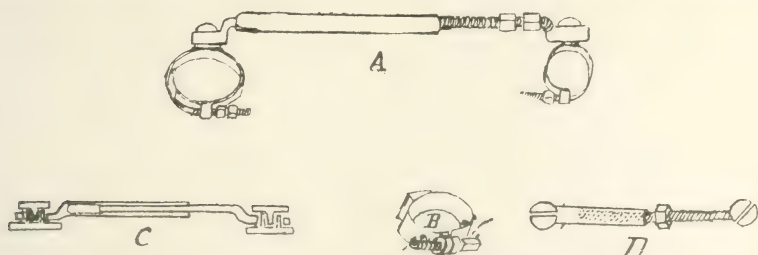


Fig 2. Showing so-called "Bielle" or crank, integral part of Pseudo Arthrose. See Figs. 27 F, 35, 36.

of the system adopted in France for handling the wounded men. The whole of the West Front is divided into twelve hospital areas, with a jaw hospital in each. Upon the news of a large engagement a jaw hospital motor car, fully equipped and carrying two surgeons, one dentist and one dental laboratory man, would proceed to a suitable part of the lines, and give the men suffering from jaw injuries "first aid" treatment; an ideal arrangement, inasmuch as in fresh

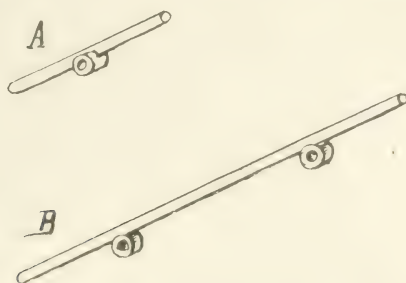


Fig. 3. Lingual Arch Bar used in First Aid work on Fractures.

jaw injuries, shock anesthesia and comparatively less swelling of the soft tissues, in addition to a lack of fibrous union of the ends of the fractured parts, make reduction of these fractures a comparatively easy matter, and also make it possible to obtain a more accurate occlusion, and if considerable tissue has been lost a more favorable prosthesis after bony union has taken place. This arrangement, according to the lecturer seemed to lend itself particularly well for war

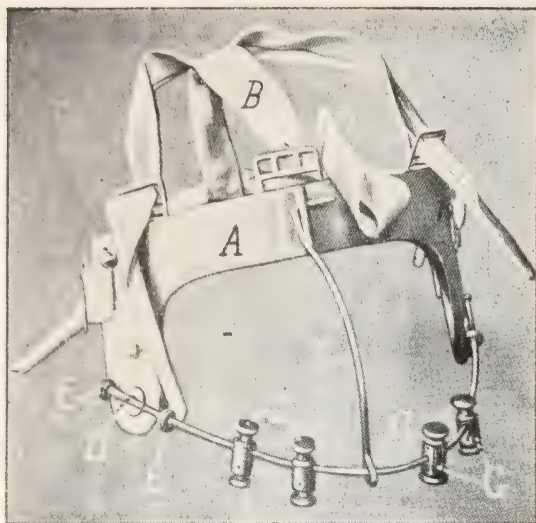


Fig. 4. Kazanjian Universal Face Support. Made up of a Gutta Percha Casque to which is attached metal bow and various Supports for Lips of Wounds, Fractures, etc. See Figs. 16, 17.



Fig. 5. Kazanjian Universal Face Support, fitted to a patient. A Rubber Tip made for Supporting tissue below the eye.

purposes, for the additional reason that the injuries resulting from war accidents are more complex and difficult of treatment than civilian injuries, and inasmuch as jaw injuries resulting from fractures, are nearly always followed by displacement of parts due to

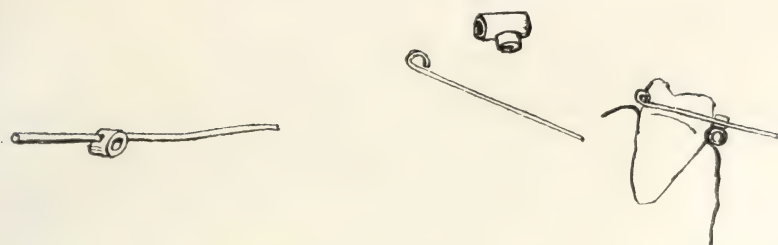


Fig. 6. Detail of First Aid treatment for Fractures, as described in the Text. Also Interdental Anchorages with Stems.

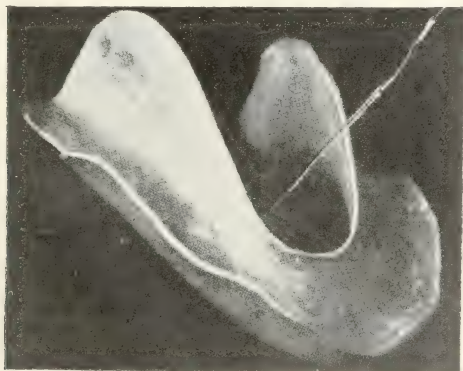


Fig. 7. Splint for lower Endentulous fracture. On the reverse side, not shown, are loops for external supports. See Fig. 15.

action of elevator and depressor muscles, and also that the problem is to replace these displaced parts directly against the action of these muscles, with the restoration of a proper occlusion, the practical utility of the above organization would seem readily apparent.

After the "first aid" treatment given in the field. (a brief description of which follows), the patient then proceeds back to a base hospital.

From the dental standpoint the chief interest of the jaw ambulance car consists of what might be spoken of as a "first aid box," containing an assortment of material for first aid work on the field, sufficient for the treatment of from three to four hundred jaw injury cases.

The equipment contained in the box (Fig. 1) is made up as follows:

- 100 arches, plain.
- 30 arches, threaded.
- 30 arches, lingual (Fig. 2).
- 10 caps.
- 10 threaded cranks (Fig. 3).

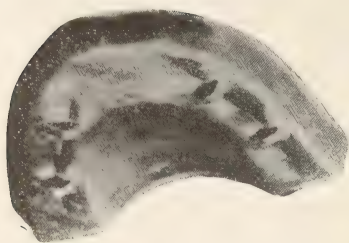


Fig. 8. Splint for Endentulous Upper. See Fig. 14. Note loops for external prolongations.



Fig. 9. Chin Piece. Note buttons for attachment of ligatures, elastic, etc. See Fig. 17.



Fig. 10. Teeth Wired to the External Arch. See Figs. 6, 11.

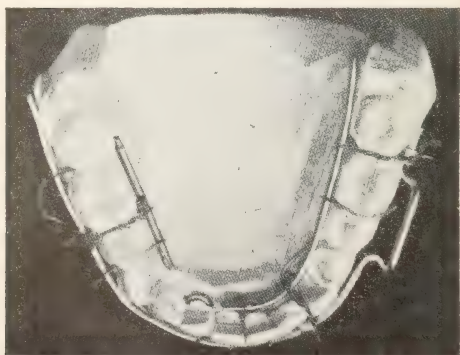


Fig. 11. Teeth Wired to Buccal and Lingual Arches. Flange on right for preventing lingual movement of the fragments in cases with Loss of Substance.



Fig. 12. Detail of wiring shown in Figs 10 and 11.

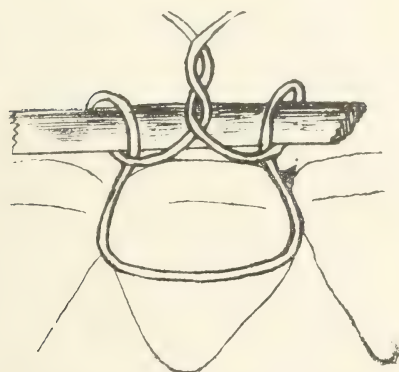


Fig. 13. Detail of wiring shown in Figs. 10 and 13.



Fig. 14. Upper Splint with External Projections, fastened with elastic to Woven Casque.



Fig. 15. Lower Splint with External Projections held in place with Chin Bandage. Care must be used in this case to prevent inward displacement of the fragments.



Fig 15A. Chin Piece in Position. See Fig. 9 for Comminuted Fractures. Held against Woven Casque by elastics.

1 Kazanjian universal head piece (Figs. 4, 5).

Angle D. bands.

Assortment Interdental anchorage, with stems of 1-10, 3-10, 5-10, 7-10, 9-10, 12-10 m.m. (Fig. 6).

Also cross tubes (Fig. 6).

Edentulous trays, upper and lower. Looped for external prolongations (Fig. 7 and 8).

Chin pieces (Fig. 9).



Fig. 16. Kazanjian Universal Face Support in use. Upper pair before and after adjustment, for surface wounds and for supporting a surgically formed nose. Lower pair, for Lips of Wounds and supporting Nostrils and wounds at side of Nose.

OUTLINE OF TEMPORARY TREATMENT OF FRACTURE.

1. Bend arch to approximate shape of the mouth (Figs. 10 and 11).
2. Interdental anchorage, slipped in.
3. Brass wire twisted, looped and bent buccally (Fig. 12).
4. Balance of teeth wired to arch (Fig. 13).

In case of a fracture attended with loss of bone, in which the lower fragment is drawn laterally by pterygoid action, a flange is formed which engages the upper arch, which may be reinforced by a lingual application of the interdental anchorage. (See Fig. 11.)



Fig. 17. Kazanjian Universal Face Support in use. Upper pair for supporting a fracture of the Superior Maxilla (horizontal). Lower pair for supporting Lips of an Extensive Wound.

EDENTULOUS CASES.

For fractures of upper edentulous case, in absence of artificial dentures, a modified Kingsley splint was suggested by the lecturer. Modelling compound is placed on splint (Fig. 8), and with fracture held in reduced position, is pressed into place, cooled, removed and a head bandage applied, holding parts in approximation until bony union is completed. (Fig. 14.)

For horizontal fracture of lower edentulous jaw, also in the absence of an artificial denture, a splint covering a large area of the lower jaw is made of pressed aluminum (Fig. 7) covered with soft-



Fig. 18. A modification of the Kazanjian Universal Face Support. Two special Chin Pieces, fitted to hold in place badly lacerated chin. Note the Upward and Forward movement given to the lower chin piece by the double elastic traction.

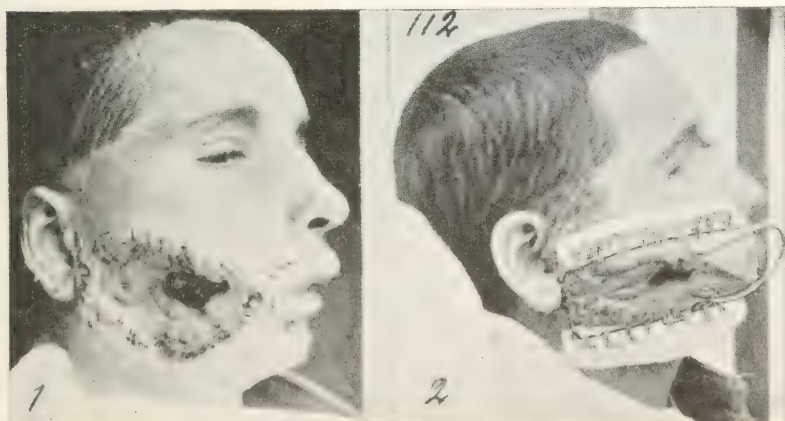


Fig. 19. A device which frequently saved the situation, devised by Major Villian. Adhesive Tape with a plurality of hooks sewn thereon, a wire passed through, and a spring traction drawing the lips of the wound together.

ened modelling compound introduced while parts of fracture are approximated. This is removed, chilled and external wires fitted, and the whole bandaged to place with a chin bandage. (Fig. 15.)

The use of the chin piece (Fig. 9) is shown in Fig. 15A. The case

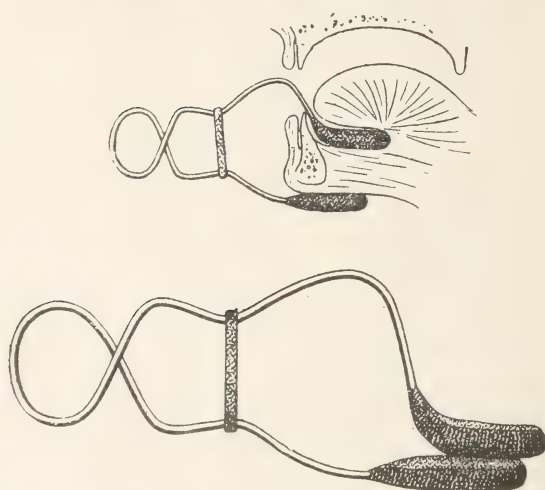


Fig. 20. Elevation cross section in situ, and view in situ of a clamp for hemorrhage, devised by Major Kazanjian. Hemorrhage takes place almost always with Maxillar Fractures.

being either edentulous (in which case a biting block is made), or with teeth (in which case the teeth are held in occlusion against the uppers) the nature of the fracture being comminuted, or with a large number of fragments. The chin piece is fitted by cords or elastic until a more permanent appliance is fitted.

Referring to another phase of the magnificent work which our splendid French confreres are doing, Major Villian made reference to the co-operation which exists between the surgical and dental services in the construction and fitting of dental appliances, to hold flaps, parts, etc., in position, following plastic surgery. Two devices were described, one the result of the genius of Major Kazanjian of the Harvard Surgical Unit, in antebellum days, head of the

prosthetic department in the dental college of Harvard University. This appliance consists of a head piece with a universal arrangement of rubber tipped clamps which may be fitted to hold the lips of almost any type of wound together. (Figs. 4, 5 and 16, 17, 18.)

The other, a simple, but nevertheless effective device, devised by Major Villian himself: Two lengths of surgical adhesive tape upon which are sewn a plurality of hooks, these applied to lips of wound in which stitching was impossible, and a wire passed through the hooks with a spring clamp on the wires, resulting in easy and complete apposition. By such co-operation of the dentist with the surgeon, splendid results (instances of which were frequently referred to by the lecturer) are secured. (Fig. 19.)

In addition to this, the lecturer showed a special clamp made from spring wire, which was found most useful on the field in connection with the hemorrhage which often accompanies fractures. In Fig. 20 is shown this clamp, at the end of which is mounted a vulcanized rubber compression pad. The whole a product of the genius of Major Kazanjian.

(To be Continued in February and March Issues.)

A Removable Saddle Bridge *

OLIVER MARTIN, D.D.S., OTTAWA.

THE structure consists of a cast gold saddle supporting the teeth to be restored and a telescope crown which forms the attachment. There is nothing new or original in the use of the telescope crown as a means of attachment and its use is endorsed by such eminent authority as Dr. A. Peso, of New York.

About six years ago the writer attempted the construction of a saddle bridge carrying three teeth, the superior right first bicuspid being used for anchorage; this was fitted with telescope crowns made in the usual way and carefully fitted. The case, however, was not a success for the reason that the ridge was too flat for this type of bridge, and permitted lateral motion of the saddle under the stress of mastication.

This point was not given due importance at the time, however, and an attempt to remedy the trouble was made by soldering a square bar to the fixed crown, with a corresponding groove in the removable one. This had the desired effect of preventing lateral motion, and for a time success seemed assured, but soon another difficulty arose which in itself was most annoying. Constant use loosened the outer crown and the patient was obliged at intervals to have it tightened.

While trying to devise some means whereby this trouble could be

*Read before the Ottawa Dental Society, November 14th, 1918.

overcome, the writer conceived the simple expedient of making the bar above referred to taper instead of square, this acting as a key, tightened automatically under stress and proved most effective. This case, however, could not be deemed other than a failure, owing to poor judgment in its selection, the ridge being, as already stated, too flat for this type of restoration, in consequence of which far too much stress was imposed upon the attachment.

This failure does not detract the usefulness of this type of bridge, however, but points out the danger invited by its indiscriminate use.

The principle involved in the construction of this type of bridge is open to serious criticism, and theoretically it would appear to be deserving of it, but in actual results under the severest test, provided proper judgment is observed in its adaptation, it will prove most efficient by giving healthy, comfortable service, without injury to the tooth serving the purpose of retention, and can be depended upon to restore lost function to a degree exceedingly difficult to obtain by any other type of bridge, especially in cases where the lower molars or lower molars and second bicuspid, have been lost on one side, all other teeth in the mouth being intact, whether naturally or by other restorations. It is equally adaptable to the superior maxilla when a similar condition exists.

The technic of construction is quite simple. One point, however, needs emphasis and that is accuracy, attention to detail is necessary to obtain accuracy, without which this type of bridge will prove very disappointing. The tooth to be used for retention is trimmed in the usual manner for a shell crown; by usual manner it is implied to mean correct manner, that is to say all contour must be removed and a wire measure taken slightly below the conical margin. A straight band is sweated and made to fit tightly. A flat top is soldered to this band, as little solder as possible being used. To the distal surface of the crown is now attached a taper key, preferably made of platinized gold. (See Fig. 1).

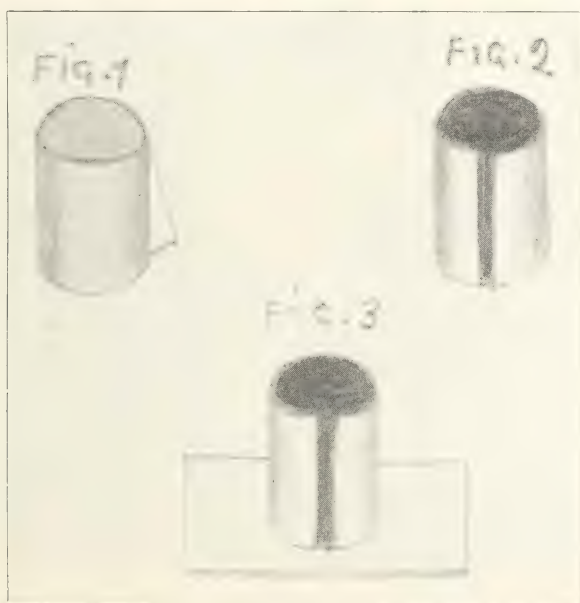
In some cases when the tooth is short, owing to a close bite, it is advisable to place this taper key slightly towards the lingual surface. It will be readily seen that by placing the key in this position, the saddle will offer greater resistance to lifting strain, especially when used in eating food of a sticky nature, as the stress thus imposed is brought to bear against the flat side of the key and not against the tapered edge. Why not always place the taper key in this position? Simply because it is not always necessary, and a neater and less bulky appliance will result from placing it on the distal surface of the crown, in which position it comes over the saddle and its bulk is covered by the vulcanite and teeth.

If and when the bite is short and the tooth to be used for retention has been devitalized, a further step may be taken to advantage; by placing in the first crown in addition to the taper key a straight

tube about six or eight millimetres in length, closed at the bottom and soldered at the top to the crown.

The first crown *finished* and *polished* is now placed in position in the mouth, and a bite and impression taken; before filling the impression, place head down in the crown a small brass screw nail. This will effectually prevent the crown from breaking away from the model during the work of completing the case.

The next step is to make the second crown. A piece of thin airchamber metal about the thickness of heavy paper, or as a substitute, writing paper might be used, in width corresponding to the length of the first crown. This is bent around and cut so that the



ends touch each side of the taper key and is used as a pattern to obtain the exact length of gold required for the band, which, having been cut to pattern, is fitted over the first crown, especial care being taken to see that it is well adapted and that the edges fit accurately against each side of the key.

The use of a *magnifying glass* is of great value in obtaining a good fit, which is so essential, and its use should be cultivated.

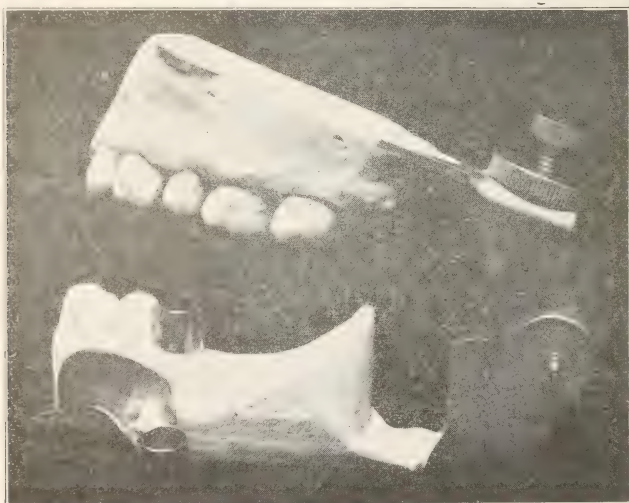
The band is now carefully removed and stood end up on a piece of gold, large enough to be conveniently held with tweezers and soldered in a bunsen flame, using very little solder. No attempt to wire the band to this piece of gold which forms a flat top should be made, as any such procedure will alter its shape and thus render an accurate fit impossible. Glass borax makes a good flux, as it will not disturb the band.

The top is trimmed flush, and this unit now has the appearance of a flat top crown, with a slit on its side. It may be deemed advisable before proceeding, to try this unit on over the first or stationary crown to ascertain if it fits properly.

Next, solder to the band on one side of the opening a thin strip of pure gold; replace and burnish this pure gold over the taper key and down on the other side of the band, thus forming a groove, or key-way, which may be readily observed will fit the key perfectly.

The removable crown is carefully taken off and the pure gold soldered to the band at the opposite side. The contouring of this unit is the next step, and may be obtained by casting the contour and occlusal surface, or by using solder.

There is little to choose between these methods, except, perhaps,



when deep cusps are required casting would appear to be easier and more accurate.

Regarding contour, however, it is obvious that telescope crowns preclude the possibility of much contour.

Note.—If a tube is fitted to the stationary crown a pin is now adjusted and attached to the removable one.

Making the saddle is the next step. Lay over the model thin sheet wax, patting it well down with a damp sponge, and trim to desired shape, which should be such as will not encroach upon muscles. A very narrow strip of wax is attached along the margin, to form a finish for the vulcanite. A similar strip is also attached in loops on the ridge to serve as retention for the same.

The sprue wire is now stuck to this wax model, preferably about its centre, and before removing from the cast cover carefully with investment. This prevents the possibility of distorting the wax, which

is now invested, and casting proceeded with in the usual way. The saddle is next finished and polished, then attached to the second crown with sticky wax. Remove very carefully, invest and solder.

If, however, any doubt exists on removal as to the proper relative position of crown and saddle, it would be deemed advisable to take an impression, holding the distal end of the saddle in place while pressing down over the crown and anterior portion of the saddle a thick, quick setting mix of plaster. Both crown and saddle may now be removed, assembled in the impression, and a putty-like mixture of investment pressed into place. Soldering can be proceeded with almost at once. This done, the case is ready for attachment of the teeth.

As the vulcanite is not required to add strength, pink rubber may be used, and makes a very neat finish.

Should it be found necessary to support the tooth, or root used for retention a half-jacket can be attached to the approximate tooth, and joined to the first crown near the cervical margin, on the lingual surface, with number fifteen wire. A small groove being cut in the mesio-lingual cervical edge of the second crown to fit over this wire.

Before adjusting the occlusion it is necessary to place on the flat top of the first or fixed crown a thin washer. This is to allow for settling of the saddle, and is only held in place temporarily with sticky wax; it may be fashioned of gold, cardboard, airchamber metal, in fact, anything which will keep the crowns slightly apart during the further process of constructing the bridge. The thickness of this washer must be left to the operator's judgment, in as much as the alveolar ridge differs materially, and should be examined for density, before determining what allowance should be made for settling.

Perhaps it would be of interest to add that in cementing, both crowns should be put on together, a little vaseline having first been smeared inside of the second crown to prevent the cement from crowding between them. If the first crown was cemented to place and was not in exact position the saddle would not seat properly on the ridge, but by placing both on at once the saddle can be held in position till the cement sets.

War Activities Interfere With Regular Courses

THE examinations of the New York State Dental Board, usually held in the month of June, have been postponed until the first Tuesday in September, 1919. The reason given for this action is that a number of the American dental colleges are planning to extend the course of instruction for the current senior year into July, owing to the interference of the Students' Army Training Corps, with the regular course of dental instruction.

Course in Post-War Oral Surgery and Prosthesis, Royal College of Dental Surgeons, Toronto, Dec. 16-21, 1918

FRED C. HUSBAND, D.D.S., TORONTO.

A POST graduate course covering War Prosthesis, Fractures, Splints, General and Local Anaesthesia, Nerve Blocking, Oral Surgery and Physical Diagnosis was held in the Royal College of Dental Surgeons building, corner of College and Huron Streets, Toronto, from December 16th to 21st, 1918, inclusive, under the joint auspices of the Royal College of Dental Surgeons of Ontario and the Preparedness League of American Dentists.

The course was unique in conception, and was largely due to the efforts of Dr. Seccombe, Superintendent of the R.C.D.S., ably assisted by the following committee: Doctors Harold Clark, Toronto; H. R. Abbott, London; Fred J. Conboy, Toronto, and W. M. McGuire, Simcoe.

The class was limited to one hundred members, instructed in groups of twenty-five by the following faculty: Lieut.-Col. Guy C. Hume (Fractures and Splints); Major W. E. Cummer (War Prosthesis); Arthur E. Smith, D.D.S., M.D., Chicago (General and Local Anaesthesia, including Nerve Blocking); Leroy S. Miner, M.D., D.M.D., Boston (Oral Surgery and Physical Diagnosis).

The membership of the class was indicative of the wide interest taken in the course, including as it did military and civilian dentists in Canada from ocean to ocean, prominent eye, ear, nose and throat specialists, and between thirty and forty prominent American dentists from points widely separated.

Many of these latter were well known to Canadians, having been guests of our Canadian societies at their meetings in recent years, and it was with no small interest and appreciation that we noted their presence and their expressions of satisfaction in the course.

On another page of this issue will be found a reproduction from a photograph taken of the class in front of the R.C.D.S. building.

It might be well to state here that the fees received were applied in their entirety to paying the lecturers and meeting small sundry expenses, such as printing, etc., the directors of the R.C.D.S. placing the College building, equipment and facilities at the disposal of the committee free of all cost.

Col. Hume's lectures were replete with the latest methods of meeting the needs of war patients suffering from the various fractures of the jaws. His wide knowledge and experience in actual military hospital clinics, coupled with that as an Orthodontist, has served him in good stead, and it was evident that this latter has helped

him to design splints not only of greatly lessened weight but of greatly increased convenience to the patient.

Major Cummer, while not having had the military hospital experience, did not appear at a disadvantage. His genius had enabled him to grasp and master the latest and best methods in Prosthetics, of meeting the needs of these unfortunate patients. The ease and dispatch with which he constructed appliances of various types before the class was indeed astonishing.

Dr. Smith conducted his lectures and clinics as he only can. His subject was large—too large to do full justice to in the time at his disposal—and yet he left with his class a foundation upon which every member could build who would follow his teaching. His specimens and moving pictures should enable every member of the class to attain success in this most important branch of the healing art.

Dr. Miner in his course on Physical Diagnosis led us into a field which all thoughtful dentists have long felt was a necessary one for the rendering of a better dental service to the community. His clinics on Oral Surgery showed skill and proved most instructive.

One of the most pleasant features of the whole course was the spirit of good fellowship displayed not only amongst the members but between the lecturers and the members of the class.

We understand somewhat similar courses are to be held at various centres in the United States, and should prove a great boon to those entering the classes as well as to the public at large.

The following is a list of those who attended the course:

- | | |
|---|--|
| Abbott, E. C., 2 Bloor St. E., Toronto. | Crawford, J. C. A., Haileybury, Ont. |
| Allen, Capt. H. S., Ottawa, Ont. | Coon, W. H., 22 College Street, Toronto. |
| Armstrong, J. W., 22 College St., Toronto. | Coram, G. H., Carlton Street, Toronto. |
| Arnold, E. F., 2 Bloor St. E., Toronto. | Coram, J. W., 26 College St., Toronto. |
| Astle, Capt. W. W., Edmonton, Alta. | Cunningham, H., 182 Quebec Avenue, Toronto. |
| Badgley, F. M., 110 Avenue Road, Toronto. | Daly, C. L., 2 Bloor St. E., Toronto. |
| Barker, C. R. 753 Fifth Avenue, New York. | Daman, K., Woodstock, N.B. |
| Bagshaw, Capt. D. J., 100 Avenue Road, Toronto. | Davies, T. A., 578 Sherbourne Street, Toronto. |
| Bailey, Capt. B. S., Winnipeg, Man. | Doore, Capt. J. C., St. John, N.B. |
| Biehn, C. E., Chesley, Ont. | Dubeau, Eudore, 308 Sherbrooke E., Montreal, Que. |
| Bothwell, J. A., 694 Spadina Avenue, Toronto. | Duff, Capt. J. H., 460 Jarvis Street, Toronto. |
| Black, W. A., 2 Bloor St. E., Toronto. | Dunlop, Capt., M. D. No. 2, Toronto. |
| Boyd, Geoffrey, Bloor E., Toronto. | Emmett, G., 1 Maynard Ave., Toronto. |
| Bray, Capt. G. H., Winnipeg, Man. | Everett, G. W., Hamilton, Ont. |
| Bradley, Lt.-Col. F. H., M. D. No. 4, Montreal, Que. | Fife, B. O., 229 College St., Toronto. |
| Brock, Capt. B. W., St. Anne de Bellevue Military Hospital. | Forester, A. M., 390 Doctor's Bldg., Nashville, Tenn. |
| Brooks, C. E., 2 Bloor St. E., Toronto. | Fowler, Capt., C. H., Niagara Polish Camp, Niagara, Ont. |
| Bucknall, J. A., 129 Kirby E., Detroit, Mich. | Franz, H., 22 E. Washington, Chicago, Ill. |
| Campbell, D. K., 436 Gold St., Brooklyn, N.Y. | Godsoe, Capt. F. A., St. John, N.B. |
| Canning, Capt., M.D. No. 2, Hamilton, Ont. | Grainger, Capt. G. W., Brant House, Burlington, Ont. |
| Chalmers, W. L., Toronto. | Hallenberg, Albert, Fargo, North Dakota. |
| Collings, M. F., 6 West 50th Street, New York. | Hayden, Capt. W. Y., M. D. No. 1, London, Ont. |
| | Healy, Capt. P. J., C.A.D.C., Calgary, Alta. |

- Hillis, W. A., 22 Lafayette Place, Greenwich, Conn.
 Hull, G. A., 123 West 73rd Street, New York.
 Husband, F. C., 2 Bloor Street East, Toronto.
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 Lucas, R. F., 612 J. M. S. Bldg., South Bend, Ind.
 Lundy, W. E., Kent Bldg., Toronto.
 Marlatt, H. G., 18 E. Eagle, Buffalo, N.Y.
 Marshall, O. A., Belleville, Ont.
 Mason, A. D. A., 2 College Street, Toronto.
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 Mitchener, Capt. H. L., Kentville, N.S.
 McIntire, W. R., 231 Broad Street, Providence, R.I.
 Neil, Ewell, 226 Doctor's Bldg., Nashville, Tenn.
 Pearson, C. E., 2 Bloor St. East, Toronto.
 Purdy, Capt. J. H., M. D. No. 1, Ottawa, Ont.
 Reese, R. H., 103 Macon St., Brooklyn, N.Y.
 Rabb, J. W., 1336 Widner Bldg., Philadelphia, Pa.
 Robert, J. G., 174 E. Ferry St., Buffalo, N.Y.
 Robertson, H. A., Hamilton, Ont.
 Royce, Lt.-Col. George C., Toronto.
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 Santo, A. E., London, Ont.
 Shantz, U. B., Kitchener, Ont.
 Simpson, J. F., Trenton, Ont.
 Simpson, Major S. H., Kingston, Ont.
 Shaw, Col. F. P., M. D. No. 1, London, Ont.
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 Sutton, C. E., 449 Spadina Ave., Toronto.
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 Thornton, Capt. R. D., 240 College St., Toronto.
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- Delegates, United States:**
 Beach, J. W., 131 Allen St., Buffalo, N.Y.; Pres. Preparedness League of American Dentists.
 McCarthy, A. J., 131 Allen Street, Buffalo.
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- Delegates, Dominion of Canada:**
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 Thomson, Lt.-Col. W. G., M. D. No. 2, Toronto.
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 Levey, Capt. C. H., M. D. No. 11, Victoria, B.C.
 Mann, Capt. H. E., Halifax, N.S.
 Washburn, Capt. B. L., 46 Grande Allee Apts., Quebec.
- Special Committee:**
 Box, Harold K., 229 College Street, Toronto.
 Thomson, Capt. H. S., M. D. No. 2, Toronto.

Address at Opening of Post Graduate Course at Royal College of Dental Surgeons

J. W. BEACH, D.D.S., BUFFALO, N.Y., PRESIDENT PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

I AM deeply sensible of the honor of appearing before this representative body of Canadian and American dentists in joint session, and am cognizant of the great significance which it bears to the future welfare of our profession and to humanity.

This gathering marks an epoch in the professional advancement of the Dominion of Canada and the United States. The common object that has brought us together will forge more strongly than ever the bonds of our profession's weal and humanity's cause. No grander purpose could be conceived than that of seeking knowledge for the benefit of others, and no greater power exists than that of knowledge properly applied. That which you shall receive is given you in trust and not for personal gain. Your presence here is sufficient warranty of your faithful stewardship.

The great war just ending has wrought a complete change in the aspect of the dental profession. From a military standpoint we have emerged from the near zero mark to a definite, advanced status, which, although not all that we hope for and expect, will form the basis of development that finally will give us a dental corps administered by dentists only, which will be the natural and logical result of existing conditions.

In relation to civilian practitioners a great metamorphosis has taken place. Up to this time it is, perhaps, more mental than actual, but through observation and limited experience we have learned that a great prospect is before us and that we must help ourselves if we are to reap the benefits within our grasp.

The course of instruction about to be given in war oral surgery and prosthesis in this institution is the first gun to be fired in a well-organized campaign to acquire practical knowledge and skill which is to be applied for the benefit of our soldiers whose injuries come within our rightful field. The report of this gun will be heard throughout the United States, and when its echo shall have died away it is the earnest hope of the Preparedness League that thousands of civilian dentists will have been prepared to serve our boys who have suffered to make safe for our children and for ourselves our own beloved country.

Mr. President, I want to offer the profound thanks and deepest gratitude of every man here from the United States to yourself, the directors of the Royal College of Dental Surgeons, and your collaborators, for giving us the splendid privileges of this course and the use of your institution for this purpose. I wish also to sincerely thank the Canadian Army Dental Corps for most generous assistance in placing the resources of the corps at our service during this time. Comparisons are odious, therefore I will only say that I hope fortune will hasten the day when we, who represent the civilian practitioners of the United States, may receive the same sympathetic co-operation from those who have similar benefits to dispense in our own military organization.

I must say a few words about the Preparedness League of American Dentists. First of all I want to impress this fact: The League is a *principle* and the organization representing it is but a vehicle for

its application. This principle is represented by the inseparable trinity, Give, Sacrifice, Serve, which in the final analysis means true Charity. Thus has the League been placed upon a plane above the influence of politics and personal advancement to the disadvantage of others. Its record speaks for itself in no uncertain terms, and its members are justly proud of the untold good that is being derived from its activities.

By this same principle and on the same plane, we must continue to advance, that the benefits of our efforts may reach as many of our profession as possible and through us find practical expression in the mouths of those in need.

No doubt many of you will say that such views are more altruistic than practical. I do not believe this to be true, for there is no more practical guide in every circumstance of life than the Golden Rule, and the League endeavors to exemplify this principle insofar as possible.

On this basis we appeal to you for moral support and loyalty. We want you to enter into the great work that is before us and take a real part in its activities. The League is not a one-man institution. It belongs to you the same as to every other member, and its destiny is in your hands. The only requirement is to adhere to the principle upon which it is founded.

I will name some of the activities that are before us: Co-operation with the Home Service Section of the Red Cross for the care of worthy families of soldiers and sailors until such time as their needs are otherwise provided for. I will read a portion of a letter sent to State Directors by Director General Tracy:

"It has also been stated that one of the greatest possibilities for service on the part of the Preparedness League and its members was a full and free co-operation between the League and the Home Service Section of the Red Cross. In many instances the wives and families of soldiers in the U.S. Army who have been used to private dental treatment, but who because of the reduction in their incomes cannot now afford to go to the private practitioner, should be taken care of by the Volunteer Dentists of the Preparedness League.

"The Home Service Section of the Red Cross through their authorized agents will investigate each case as presented, and in those cases recommended for dental treatment at the hands of the Preparedness League, the patient will receive a card bearing the endorsement of the Red Cross, stating that the patient is a member of a soldier's family and worthy of free dental treatment.

"In this manner much suffering can be alleviated and much dental trouble prevented among the families of the men who have gone forward to defend our country. The medical profession is already co-operating most generously with the Home Service Section of the Red

Cross, and it is hoped that every member of the P.L.A.D. will share in this work."

A broader field of usefulness for the League is that in which we are at present engaged—a course of instruction in maxillo-facial surgery and prosthesis for the civilian practitioner. The Surgeon General's department of the United States is proceeding with the expressed belief and intent that all cases requiring rehabilitation will be completed by military surgeons before the soldier is discharged from the army and therefore the department has not seen fit to co-operate in our plan. If our Canadian confreres assumed the same attitude we would not be here to-day. Let it be distinctly understood that we are not here in opposition to our own military organization. Quite the reverse, in fact. It is our duty to determine who is right, and should we be so fortunate it is equally our duty to use our added knowledge to uphold and strengthen our dental corps and its supervisors. The military cannot exist without the support of the civilian forces. It is the duty of the League to so organize our civilian profession that it will form a solid and united foundation for our military structure. This forms a programme for the immediate future.

It is the experience of the Canadian Army Dental Corps that many soldiers will not return to the military clinics for treatment after receiving their discharge but apply, instead, to the civilian dentist, preferably to one who gave them attention before entering the service. There is no reason why this will not obtain in the States as well.

Another source of supply will come through the Americans who have served with Canadian units, and there are many such. Many injured will seek our shores from the other allied nations who will need the most skilful service we can give them, therefore we are assured of good and sufficient reasons for preparing to meet these several demands.

A still further latitude for our efforts is adequately outlined by Dr. Kirk in the December *Cosmos*, from which editorial I will quote the following:

"Collateral to the organized military dental service of the Government the Preparedness League of American Dentists was created as a voluntary service by the civilian dental profession . . . its object being to eliminate the dental disabilities of recruits before their enlistment. We have from time to time published reports setting forth the extent of membership and the results accomplished by this patriotic organization. The figures are impressive, but what is of much greater importance as affecting the future status of the dental profession is the convincing argument which the work of the Army and Navy Dental Corps, and that of its adjuvant, the Preparedness League of American Dentists, offers as to the importance of the public ser-

vice relationships of dentistry. Before the war dentistry was subject to no little criticism for its lack of practically expressed interest in public health service; but the war service of dentistry has educated the public to a realization of the importance of dental service, and it has revealed to the dental profession itself the desirability of rendering that service. It is just this great educational result that needs now to be capitalized and organized for the benefit of the public and the dental profession as well.

"With demobilization the military object of the Preparedness League will vanish, but this great organization should be held together and its energies utilized in civilian channels. Divested of its military purposes, its essential reason for existence is still the same, viz., the altruistic service which dentistry can render in connection with the public health. This is concerned with dental service in schools, hospitals, eleemosynary institutions, industrial establishments and all avenues by which the general public in the larger sense can be reached. The democratization of social, industrial and commercial activities, now the keynote of the reconstruction period, must also include the democratization of dental service.

"Moreover, there is yet much to be accomplished in reorganizing the dental profession and its public service upon an autonomous basis of control; by which we mean the freeing of dental activities everywhere from the hampering interference of medical direction and placing it under the control and supervision of its own membership. No organization is better fitted to do this work on broad lines than the Preparedness League. Dental societies are handicapped by a local 'provincialism' that is not a hampering factor either in the objectives or activities of a nation-wide group such as the Preparedness League. By all means, then, let the League be kept intact so that its energies may be directed toward the objectives of dental service in the era of peace as they have been so successfully enlisted in the winning of the war."

Therefore you perceive justifiable reasons for the continued existence of the League. Every department of our profession needs the support of a liberal organization that will form a connecting link, as it were, between the public and our profession.

There is a still broader prospect before us. Should not our organization have international significance? Are not we our brother's keeper? Have not we an opportunity to lend a helping hand to those of our profession in the devastated regions of France and Belgium and is it not our duty to do so?

American dentists have gained much by the war and to-day, as a profession, we command greater resources than that of any other nation of the world. Should we tuck all of this gain into our purses and let our unfortunate brothers shift for themselves? Let us take

this thought seriously and see if we cannot do something for them in their great need.

In these several objects, should we not be internationally linked with Canada? Should not our membership and activities join America and Canada in our great work? It is a broad but feasible prospect.

Our energies should, at all times, be subject to the approval of our National Dental Association and the Canadian Dental Association should a union be effected. The League at all times must remain subsidiary to the organization under whose auspices it has operated and continue to be guided by its council. An ever conscious object of the League should be to increase the membership and influence of our National Dental Association.

In closing I will quote a paragraph from an essay on "Success In Life," by Henry W. Curtiss: "Such a life alone makes men honored and loved, makes of the life a sweet garden all fragrant with the perfume of its flowers which, while they blossom for the gardener, cheer and bless those who pass his way. Like the line of the brook which, as far as the eye can reach, you can follow by the fresher green of the fields through which it flows, so the influence of the really successful life is felt by all that touch it, and when it opens up into the everlasting life beyond, will still leave behind a fragrance and a fruitage which shall be a halo of blessing and an inspiration to others struggling along life's way."

Such is the hope vested in the future of the Preparedness League for each one of its members. Our ambition is to bring nearer to true success in life those who willingly accept the guidance of our organization.

Election of Board of Directors Royal College of Dental Surgeons of Ontario

THE result of the recent election for members of the Board of Directors of the Royal College of Dental Surgeons for the ensuing two years is as follows:

- District No. 1.—Major W. R. Greene, Ottawa (acclamation).
- District No. 2.—Dr. M. A. Morrison, Peterboro (acclamation).
- District No. 3.—Dr. R. Gordon McLean, Toronto (election).
- District No. 4.—Dr. R. H. Cowen, Hamilton (acclamation).
- District No. 5.—Dr. W. M. McGuire, Simcoe (acclamation).
- District No. 6.—Dr. E. E. Bruce, Kincardine (election).
- District No. 7.—Dr. H. R. Abbott, London (acclamation).

The new Board will meet at the College Building on May 12th, 1919.

W. E. WILLMOTT,
Secretary, R.C.D.S.

1919—Educational Year

FRED J. CONBOY, D.D.S., TORONTO.

THE dawning glory of January 1st, 1919, was painted by the effulgence of the same sun rising in the same sky and showering its golden beams over the same old earth and ocean that has been since time began. That day was not new except as every day is new; but it was a little mile post on the path of life, marking the fact that once more the roll of seasons had been called and all had answered "Here."

It was a point in the road where one could pause for a moment to look backward and to look forward: backward with something of disappointment and regret; forward with determination, courage, hope and confidence. Backward with disappointment and regret because we clearly saw the many places where we had failed to do our full duty and to measure up to the standard justly expected of us. Opportunity after opportunity had presented themselves, but we had either failed to recognize or refused to accept them. We had in our possession knowledge and information which would have proven a boon and blessing to our fellows, but we neglected to impart it. We knew well the unspeakable pain and suffering caused by neglecting to properly care for the teeth and mouth, but what did we do to educate the public or to warn our neighbor of the path he was blindly and ignorantly following? We were fully convinced that the nation's greatest asset, "the health of its citizens," had been most carelessly neglected, and that the only hope for the future lay in regular and systematic health inspection, but we did absolutely nothing to bring the matter to the attention of our representatives in the legislature, municipal council or school board. Truly, as we weighed ourselves in the balance we were found wanting.

We look forward with hope and confidence because we have determined that we will not continue to be remiss in our duty to our fellow-men. We have resolved to do our utmost to educate the public in regard to the ravages of dental disease and to press upon our representatives the absolute necessity of immediately establishing an adequate and satisfactory system of medical and dental inspection in every province of this Dominion. To ensure success, every dentist must accept a share of the work and do his or her part in the great endeavor to bring about this urgent and essential reform. Can the profession rely upon you? Make this "Educational Year," and let the dentists of each community combine and organize so that an active educational campaign may be carried on and the public and their representatives be convinced of the absolute necessity of Regular Dental Inspection.



A New Year Greeting

THROUGH the kindness of the Editor of *Oral Health* I have been invited to occupy a corner in his sanctum, and from this corner to "visit" with the readers of the magazine each month. I confess that the prospect is a very pleasant one to me, because I have for a long time had the desire to get in closer touch with my good friends of Canada; and now that Dr. Seccombe has so generously opened the way I look for no end of enjoyment in the fact that I am writing directly to the men of my own native land, for whom I have ever had an affection akin to the closest brotherly love.

I am so proud of what Canada has done in the big war that I want to see her do one thing more and be greater still. It is a hard thing that I am about to ask—a thing so inexpressibly hard that I have had to crucify my own convictions before I could bring myself to look upon it from my present point of view. I have gone painfully down into the Gethsemane of memory and of reflection, I have agonized over the frailty of my own natural inclinations till I am in no mood to pose as a preacher before men, but merely as an ordinary citizen of the great commonwealth of mankind. And as such a citizen I come to my friends in Canada and ask them to get hatred out of their hearts—even hatred of the Hun.

Now do not back up, edge away, and shake your head. That is precisely what I did when I first broached the subject to myself. I could not see it. The barbarous atrocities of the past four horrible years glared at me, and would not down. I saw helpless women and children maltreated beyond human belief! I saw the most fiendish ingenuity of torture meted out to mind and body without the mercy even of the wildest animal; I saw all these things and many more that are unmentionable, and I said to myself: "Nothing is bad enough in revenge for this." And I hated with all the intensity of my nature. The worst of it was that I found myself hating people instead of hating the things they stood for—and there is a vast difference. Then I discovered that in this hatred I was harming

no one so much as I was myself, and that if I continued hating it would inevitably lead to my own undoing. As I look back over it now I am convinced that one of the chief factors leading to the crushing defeat of Germany was the development and demonstration of so much hate among her people; and surely we cannot afford to follow her example in this. "What then?" I hear you ask. "Shall we let these people go without punishment?" Not by any means—they must be punished severely. They must be shown that "the way of the transgressor is hard." But we must have a care that this is done in the spirit of correction rather than in the spirit of revenge. It will not do to use our power as arbitrarily or overbearingly as the Germans used theirs after the Franco-Prussian War. As I view the whole situation the attitude of the Germans at Versailles in 1871 was the beginning of their defeat in 1918.

I confess that the most disheartening thing affecting our magnanimity toward the Germans is their own condition of mind since their defeat. A friend said to me many months ago: "This war will not have accomplished its object till the Germans are defeated, till they *know* they are defeated, and till they know *why* they are defeated."

There is no question at this date about their defeat, and some few of them may realize that they are defeated, but I am not at all sure that any of them suspect why they were defeated. Till this is accomplished the greatest good cannot accrue to the world, and we will not teach them this lesson by exhibiting revenge in our dealings with them. Neither will we succeed in our object by pursuing a mawkish sentimentality which asks men to "turn the other cheek." The German mind is not capable of profiting by this doctrine. As Lloyd George has intimated, they must pay for their folly "to the utmost extent of their possibility." This must be exacted not in hate but in justice—not in haste, but in calm deliberation over the intrinsic merits of the case.

And I am frank to admit that I see little hope of converting the present generation of Germans into a condition of mental sanity and equity. They have been so long "fed up" on the military policy of might-is-right that they are incapable of comprehending the principles of equity and justice in their dealings with others. They are so constituted that they simply cannot see any question except from their own selfish point of view. This is why we are confronted with the discouraging spectacle of the Germans reaching out the hand for help the moment they are licked, and then whining like a whipped cur because this help is not immediately forthcoming according to their own dictation.

No, I despair of the present generation, but I do hope that in the long toilsome years of the future, when the descendants of the men who have brought this folly upon the world are obliged to sacrifice day in and day out, almost as long as they live, to make good the

debt incurred by their forebears, that they will have learned the sublime lesson that there must be equity between nations as well as between individuals, and that it does not pay to ride rough shod over the rights of others. Then they will think twice before precipitating another such colossal calamity upon the world.

But the chief matter of the moment is that you and I shall purge our hearts of hatred; bearing sublimely all the agony, the torture, the injustice that have been heaped upon us by a relentless foe, and facing the future with a confidence and equanimity born of the conviction that no matter what the provocation we shall not depart one jot or tittle from the path of our highest ideals, as exemplified in the literal application of the Golden Rule. Then and only then shall we as a people come fully into the heritage which has been ordained to us by the traditions of the past, or sanctify to the highest degree the sacrifices we have made.

This then is my New Year greeting to my friends in Canada. May the coming year see the fruition of all that has been so nobly borne in the years just past.—Fraternally yours,

C. H. Johnson

Members of the Canadian Army Dental Corps Honored by the King

A RECENT list of members of the Order of the British Empire contains the names of Lieut.-Col. Smith and Lieut.-Col. Winnett, who have rendered excellent service at C.A.D.C. Headquarters, London, England. These officers and the Canadian Army Dental Corps are to be congratulated upon this recognition of service well rendered.

Registration of Freshmen—University of Toronto

THE following figures are of interest, as indicating the number of freshmen who have registered in some of the more important departments of the University of Toronto for session 1918-19:

Department of Applied Science, total	101—	1 woman
Department of Arts, total	432—	235 women
Department of Dentistry, total	121—	6 women
Department of Medicine, total	291—	33 women

ARMY DENTISTRY

By authority of Lt.-Col. Thompson, A.D.D.S., M.D. No. 2
This Department is Edited by Harry S. Thomson, Captain C.A.D.C.

- *The unselfish and efficient work of the Canadian Army Dental Corps is not yet fully understood or appreciated either by civilian dentists or the public generally.*
- *Public appreciation and recognition of Dentistry, during the period of the war, certainly depends more upon the ideals and accomplishments of Army Dentists than upon those of civilian practitioners.*
- *The Dental profession and the Dental Corps are not distinct bodies. Their interests are identical. The one is part of the other.*
- *In the conduct of this Department, Captain Thomson will be glad to receive assistance from all who are willing to help, and will appreciate receiving personal notes, suggestions, or manuscript describing interesting cases in Army Practice.*
- *Address communications to Captain H. S. Thomson, C.A.D.C., North Toronto Orthopedic Hospital, Toronto.*

The Canadian Army Dental Corps and Demobilization

TO those who have the impression that the work of the Canadian Army Dental Corps is nearing completion a few facts and statistics may be of interest at the present time to show that for some time to come there will be a great necessity for dental services in the army.

Amongst the many serious problems which are continuously arising in connection with demobilization, the dental condition of the troops when being discharged presents a very difficult problem. As the men have been entirely under the direction of the Government since enlistment, and in some cases have been in the service for over four years, it can readily be seen that the responsibility for their condition rests with the Government. During their period of service they have not been able to take advantage of any treatment except that provided by the Canadian Army Dental Corps, and while this treatment is now of the very best and has reached a high standard of perfection, it must be remembered that in the early part of the war this was not the case. Those who have followed the evolution of Army Dental Services know that for the first ten months of the war there was no properly organized effort in this connection, and that even after the Canadian Army Dental Corps was organized the handicaps encountered and the uncalled for opposition in some quarters did not tend to increase its efficiency. As a result a lot of valuable time was lost and the mouths of the men in the army were neglected. It is also quite reasonable to suppose that dental treatment in France must of necessity have been more or less of an emergency character, owing to the small number of dental officers on duty there. Although the above mentioned facts are well known to

some, there are others who have not been in touch with the conditions, and may not have realized the responsibility which rests on the Government when discharging these men.

It may interest some to know that every soldier when receiving his final medical examination in Canada receives a dental examination by a dental officer at the same time, and in Military District No. 2 a card filing system is used to keep a record of each man's condition and any other particulars which may be useful for future reference. This record is kept at a central office under the supervision of the Assistant Director of Dental Services for the District. When the man receives this final examination if any treatment is necessary his discharge is not held up, but he is given a certificate on which is entered in a general way the treatment required to render him "Dentally Fit." This certificate may be presented by him any time within two months after discharge, at the nearest military dental clinic to his home, and he will be given the prescribed treatment at public expense. When the above treatment is completed a detailed record of same is forwarded by the dental officer to the central office, where it is also placed on file for future reference if necessary.

This method is about as fair to everyone concerned as it could possibly be. There is nothing compulsory about it, and the onus of reporting for treatment rests entirely upon the man's own shoulders, and if he does not take advantage of his opportunity he has no one to blame but himself. By limiting the time in which the man may report, it will be impossible for anyone to come back six months or a year or more after discharge and claim dental services, in this way protecting the Government from unreasonable claims.

Statistics of the examinations in Military District No. 2 are available from February 1st, 1918, when this system was inaugurated, up to December 31st, a period of eleven months. During this time 11,286 men have been examined, and of this number 1,370 had not been in the army long enough to be entitled to Post Discharge Treatment, as their dental condition pre-existed enlistment. Of the remaining 9,916 there were 3,875 who were "Dentally Fit," leaving 6,041 requiring treatment. This is a surprisingly large number when we consider that these men have spent considerable time in Canada, England or France. That 60 per cent. still require treatment at the time of discharge proves conclusively that the strength of the C.A.D.C. should have been about double what it has been.

Figures are also available, showing that out of the 11,286 men examined, there were 6,756 who received dental treatment in some form or other while in the army. A large number of these were treated in Canada, England, and France, but still are not dentally fit. In Canada 3,682 were attended to, while in England 3,192 received attention, but the surprising fact of all is that in France only 978 received any dental treatment. As most of the men yet

to return will come directly from France, it is not difficult to realize what a vast amount of dental treatment will still be necessary for these men that they may be returned to civil life in a proper dental condition.

It is really hard to explain why so many are unfit on return. There are many who were considered fit overseas but now require treatment, for example, where extraction was performed in England and dentures inserted immediately after, before proper absorption had taken place, in order that the men might be moved quickly to France. These cases now require more permanent treatment. Other cases are examined where teeth could have been saved by continuous treatment, but the men were unfortunately transferred from one camp to another, or taking special courses from which they could not be absent, the result being that nothing can be done now but extraction and artificial restoration. Then again cases present where there is a history of "Trench Mouth," which now shows signs of recurrence. The old adage of "Many a slip twixt the cup and the lip" is brought to mind in these cases where it is quite evident that dentures have been in use but are now not present. On inquiry the patient shamefacedly admits that he was O.K. before leaving England for home, but lost it overboard on the way over. In this way it is very easy to tell by the number of missing dentures amongst the men returning on any particular transport whether or not a rough voyage was experienced.

As to the result of this system of attending to the discharged men it is very gratifying to state that well over 2,000 men had been completed after discharge during the past eleven months. As the last men examined still have a considerable length of time left in which to report, and as others may already be under treatment at the different dental clinics, it may safely be estimated that between 40 and 50 per cent. of the men receiving certificates are taking advantage of them. It is extremely doubtful if the same percentage of the civilian population show such an appreciation of dental treatment. This is a surprisingly high percentage when it is remembered that the men are drawn from all walks of life and that a large number have never received any dental treatment or never appreciated its value. As the question of reporting is purely voluntary, this proves in a convincing manner what a high reputation has been gained by the Canadian Army Dental Corps and also proves what a large percentage of the profession has not as yet realized, namely, that the C.A.D.C. has been the greatest factor in dental education that this or any other country has ever known.

H. A. SEMPLE, Major,

*Officer-in-Charge of
Dental Examination on Discharge.*

* * * *

INTERESTING SOUVENIR FROM THE FRONT.



THE above represents souvenir especially interesting to members of the Dental Profession, which was received a short while ago by a member of the Canadian Army Dental Corps from Captain E. A. Grant, of the 11th Canadian Field Ambulance, B.E.F., France, to whom readers of ORAL HEALTH are indebted for many interesting communications from the front.

Quoting Captain Grant: "I am sending herewith what I might call a souvenir of the battle of Cambrai—which I thought would be of special interest to you. This aluminum denture was found beside a dead German Machine Gunner, on the field, during our advance. He had evidently been blown up by a shell, as the denture had fallen out of his mouth. It is only of interest as showing German methods in Army Dentistry, and although a little crude, it strikes me, judging from the amount of trouble I have with men breaking their dentures or chipping teeth off them with hardtack, that it has many advantages for active service over porcelain teeth and vulcanite.

"The packing in this box is German substitute for absorbent cotton in dressing wounds and padding bandages and splints. It is a wood fibre, I believe. We got a lot of material out of his dressing stations."

The piece is cast aluminum, teeth and base being composed entirely of aluminum, apparently made from one casting, with clasps of apparently a gold alloy imbedded in the substance of the casting. It also has the appearance of having been duplicated from a previously made vulcanite denture of the ordinary type.

* * * * *

THE following clipping from an article entitled The Next Quarter Century in Dentistry, by Dr. W. D. Tracy, New York, in December issue of the Cosmos, is worthy of our earnest consideration. The war in four years has given us as a profession an opportunity to manifest the true "spirit of service" that in ordinary

times would have taken maybe a quarter of a century, and the "feeling of altruism" has really penetrated to our hearts, and only constant development will deepen that feeling and promote its growth, which is to keep us as individuals and as a profession in the position we would like to occupy.

"While the growth of dentistry has been very rapid and far-reaching in its effect, and on the whole satisfactory to those most interested, what can we say of the mental attitude of the rank and file of men who make up the profession, and from whom we have so often heard the clamorous call for professional recognition equal to that given to our brothers in the practice of medicine?

"Have they grown along with the profession itself, or have they clung to a rather narrow range of vision and retained a too materialistic attitude? As dentistry has grown, and as its importance as a factor in the health of the nation has been recognized and acclaimed, has the dentist become more professional in his habit of thought and in his relations with the people of the community in which he lives? Has the spirit of service and the feeling of altruism penetrated to his heart, and has he shown by his relations with humanity that he is the true professional gentleman which he wishes the world to believe him to be?

"These questions will not and should not be answered here, but the writer, with all the optimism that he naturally feels in connection with the development of dentistry, ventures the prophecy that within twenty-five years there will be many expressions of professional feeling that are not in evidence to-day."

Insanity Due to Infected Teeth

DR. COTTON, OF NEW JERSEY, REPORTS IMPORTANT MEDICAL DISCOVERY.

DISCOVERIES announcing a permanent cure for insanity by extracting infected teeth divulged by an X-ray examination, removing infected tonsils, and clearing up the digestive tract, are set forth in a report based on the results of eleven years of experimentation submitted recently to the State Board of Charities and Corrections by Dr. Harvey A. Cotton, Medical Director of the New Jersey State Hospital for the Insane at Trenton. Referring to the results of his experimental work, Dr. Cotton states:

"We are able to cure early cases in a very short time, prevent the disease from becoming chronic in a large number of cases, and restore a certain number who have been in the hospital for as long as nine years. This we are doing daily. We have found that infection of the chronic type and the resulting toxemia are the basis of many mental disturbances.

"These chronic infections are known as focal infections and may be present for years without their existence becoming known to the patient, and until quite recently the physicians and the dentists have been ignorant of their existence."

"We are practically prepared to state that this infection originates in the teeth, as we find the same organism in the abscessed teeth, tonsils, stomach, and duodenum, and in no case have we been able to eliminate the teeth as the origin of the infection. We have had five acute maniacal cases who died within a short time after coming to the hospital. Formerly the cause of death was considered due to exhaustion from excitement, but a bacteriological study in these cases showed all the organs practically infected. We feel that we have established a very important fact as applicable to general medicine as to nervous and mental diseases, that is, that the infection originates in the teeth, and after some years infects their organs through the lymphatic system."

Multum in Parvo

NICKEL-COPPER AMALGAM.—Nickel-copper amalgam, in the opinion of those who are acquainted with it, has all the virtues of copper amalgam without any of its disadvantages. I have used it with every satisfaction during the last three years or more, many of the fillings being constantly under observation. In my own case I have had a large approximo-occlusal nickel-copper amalgam filling in a second molar for a considerable time, and it stands the stress of mastication perfectly, comparing very favorably with a high-grade similar filling in the tooth adjoining. It keeps a good color and does not stain the denture, nor does it show any signs of cupping.—S. Lever, *Commonwealth Dental Review*.

NITROUS OXIDE ANALGESIA.—With the exception of a small minority this practice is not regarded with favor by the profession, nor is it justifiable in law. It is not justifiable in law and not approved by the profession because it exposes the patient to unnecessary danger, that is to say, the ends thereby served do not justify the employment of such venturesome means. It is claimed that analgesia by Noxo is only a lesser stage of anesthesia, and therefore less dangerous, that it prevents pain and its results, fear and dental neglect. But these arguments are based rather on sophistry than on facts. The facts are: (1) That analgesia may become at any moment deep anesthesia, depending on the susceptibility of patient and skill of operator; (2) That the skill required for this administration is not always possessed by a general practitioner; (3) That there are harmless and approved methods of accomplishing the same purposes; (4) That it tends to single-handed operation; and (5) That it may produce the same complications and after-effects as complete narcosis.—*Dental Cosmos*.

ORAL HEALTH

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Vol. IX.

TORONTO, JANUARY, 1919

No. 1

EDITORIAL

Professional Ethics and Proprietary Preparations

THE subject of this editorial has been prompted by the receipt, through the ordinary mails, of a circular calling attention to the merits of a proprietary mouth wash, issued by and over the name of a regular practitioner in the Province of Ontario. It is needless to say that proprietary preparations and professional ethics are not compatible. The code of ethics of the Ontario Dental Society is very emphatic on this point. Article two, Section two, rules "It is not professional to circulate or recommend nostrums." The healing profession in general looks upon this as a misdemeanour quite intolerable within the ranks of the profession. It reduces the professional man to the level of a quack and a charlatan. It does seem incredible that any member of the medical or dental profession, in good standing, should so violate the best traditions of practice and teaching as to be a party to the manufacture and sale of any proprietary preparation, be it an oral preparation, a rheumatic cure, a cough mixture, or any such panacea, to be traded over the counter indiscriminately to men, women and children, irrespective of the conditions obtaining.

The particular case cited is but one illustration of such ethical misdemeanours that rise up now and again to besmear the good name of our profession. Why should this unclean thing so persist? Does it bespeak a weakness somewhere in our professional armour? The

blame cannot be traced to a faulty code of ethics (Ontario's is of the best), nor with the authorized discipline committee of the province, which for many years has done yeoman service in the matter of professional house-cleaning. It does, however, seem to us that the great stumbling block in the dental profession in the matter under consideration is the almost criminal tolerance with which the profession has viewed the happy-go-lucky manufacture and sale of oral preparations to the general public. This wide-spread and everyday evil surely lies at the door of the dental profession. We have been like "dumb driven cattle" standing idly by whilst ignorant and profiting vendors harangue the guileless public on the wonderful curative properties of their particular product. Surely the time has come in the great forward movement in dentistry when we should rise up and for ever have done with the indiscriminate sale and use of medicated products. It is the solemn and legal duty of every dental practitioner to advise his patients against the use of any particular drug, medicine or preparation, which the condition of the mouth does not indicate. To do otherwise is clearly negligence.

Dr. C. N. Johnson, Contributing Editor, Oral Health

NO man in dentistry is more beloved or revered by the dentists of Canada than is Dr. C. N. Johnson of Chicago. It is with the greatest possible pleasure, therefore, that we announce to the profession that Dr. Johnson has kindly consented to act as a contributing editor of *Oral Health*.

Dr. Johnson's messages to the profession through the pages of this Journal will be sincerely appreciated, and will doubtless have the effect of further increasing the cordiality and friendship already existing between the dentists of the United States and Canada.

The "Dental Review" Suspends Publication

OUR readers will regret to learn that the *Dental Review*, after having completed a successful career of thirty-two years, has suspended publication. The publishers, Messrs. H. D. Justi & Son, have announced that owing to the unusual conditions created by the war, certain new postal regulations, and a reluctance upon the part of the publishers to increase the subscription price of the journal, it was decided to discontinue publication with the December number.

The dental profession and dental literature thereby suffer a distinct loss. The *Dental Review*, from its inception, has exercised a

very potent influence upon the progress and advancement of dentistry upon this continent and throughout the world. The great success of the Journal has been largely due to Dr. C. N. Johnson, who has been its editor during the past sixteen years. In discussing the passing of the journal Dr. Johnson is reported in *Oral Hygiene* to have said:

"I am sorry and I am glad. I am sorry because the *Dental Review* has been my 'baby.' I have put it to bed each month with a prayer. I have watched over it and mothered it; watched it grow from babyhood to strong, pulsating manhood.

"I am glad because for the first time in some sixteen years I have a little time to myself and my family. The magazine was a heavy responsibility. It was constantly on my mind. Like a railroad, a publication waits for no man. It goes to press on time. And like every other editor I had to 'watch my step.'"

Dr. Johnson has rendered the dental profession a magnificent service through his editorial and college activities. That he may be spared for many more years of unselfish, kindly endeavor is the sincere wish of his many Canadian friends.

Roydon Barbour Awarded Military Cross

THE Military Cross has been awarded to Capt. Roydon MacFarlane Barbour, of Fredericton, N.B., a member of class '17, Royal College of Dental Surgeons of Ontario. Going overseas as Captain with the 64th Battalion, he reverted to the rank of lieutenant in order to get to France, where he joined the 25th Battalion and was subsequently promoted to the rank of Captain. He was wounded in April, 1917, at Vimy Ridge.

Captain Barbour is a son of Captain Fred. W. Barbour, C.A.D.C., officer-in-charge of dental services, Base Hospital, Toronto, and formerly in dental practice at Fredericton, N.B.

Obituary—Dr. Roy Mills

WE regret to announce the demise of Dr. Roy Mills, who graduated from the Royal College of Dental Surgeons in 1914, and had been in practice at Thessalon, Ontario, since that time.

The late Dr. Mills contracted influenza while visiting friends in Toronto, and after a few days' illness died on January 6th, 1919, at the York Hotel. Interment took place at Thessalon.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, FEBRUARY, 1919

No. 2

War Prosthesis of the Allies

CANADIAN SESSION COMBINED N.D.A. AND C.D.A.
AT CHICAGO, AUGUST 4 TO 9, 1918.

(Continued from January Issue.)

BY MAJOR W. E. CUMMER, CANADIAN ARMY DENTAL CORPS.

FROM this point the lecturer outlined a classification of fractures, which in the opinion of his hearers would seem the ideal classification, inasmuch as it is based upon the location of the fracture or fractures, with respect to the mouth, which is as follows:

CLASSIFICATION OF MANDIBULAR FRACTURES.

See Fig. 21.

After Villian. Based on physiological action of depressor and elevator muscles.

Class 1.—Interdepressor Fractures. (Symphysis Fractures.)

Those fractures which occur between the left and right posterior insertion of the depressor muscles. (Fig. 21—I.)

Class 2.—Pre-Elevator Fractures.

Those fractures which occur between the insertions of the depressor and those of the elevator muscles. (Fig. 21—II.)

Class 3.—Inter-elevator Fractures (inferior).

Those fractures which occur in that portion of the maxilla in which is received the inferior insertions of the superficial portion of the masseter and internal pterygoid muscles. (Anglo mandibular.) (Fig. 21—III.)

Class 4.—Inter-elevator Fractures (Superior).

Those fractures which occur in that portion of the maxilla in which is received the insertion of the internal pterygoid, deep portion of the masseter muscle, and temporal. (Fig. 21—IV.)

Class 5.—Post Elevator Fractures (Condyle Fractures).

Those fractures which occur posterior to the insertion of the elevator muscles. (Fig. 21—V.)

Further Modified:

With loss of substance.

Without loss of substance.

Also Modified:

Capable of reduction.

Capable of partial reduction.

Incapable of reduction.

Also

Each fragment bearing teeth.

One fragment not bearing teeth.

Neither fragment bearing teeth.

As previously pointed out, these war fractures differ materially from civilian fractures inasmuch as the displacement is greater and the number of fragments is larger, in addition to more extensive surface injury.

Inter-Depressor Fractures. (Symphysis.) A. Without Loss of Substance.

Dr. Villian showed two different examples of this class with characteristic exquisitely made appliances for their treatment—one without loss of substance and another with loss of bone. Fig. No. 22 shows that appliance used in the treatment of the first named case, the fracture being vertical and in the median line with displacement. (Fig. 22A.) Impressions are made and a cast formed. Upon this cast two thicknesses of Ash's thin wax are adapted, forming a continuous covering for the teeth on each fragment. Sufficient of wax is removed from the inclined plane surfaces of each of the cusps in order that they may exert a correcting force against the teeth in the fragments in the direction of proper occlusion: a point upon which great stress is laid by our own authority, Col. Hume. These wax full caps, or "gutters," as the French say, with perforations exposing the inclined planes of the cusps, are gently lifted off and invested with multiple sprue wires in a suitable casting apparatus, and cast in a suitable metal, Victoria metal, pure silver and similar. This being accomplished, vertical tubes are soldered in parallel relation to each other on each of these lateral gutters, also upon the labial is soldered surface a ratchet and locking device. (Fig. 22B.) This being completed the appliance is cemented into position with Ames's

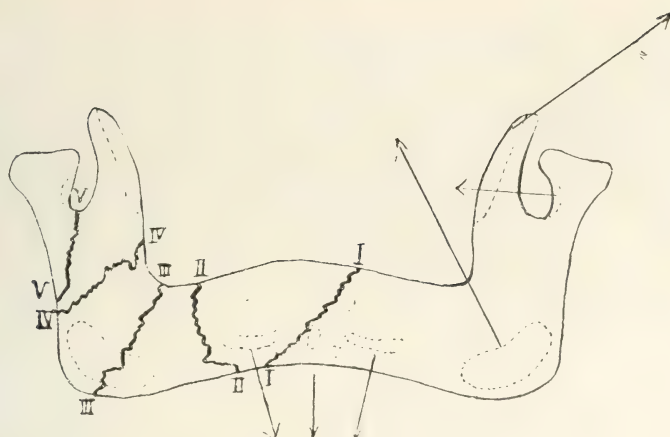


Fig. 21. Schematic representation of various fractures in Major Villian's Classification. Dotted lines represent muscular attachments, arrows the resulting moments on the bony fragments, and the Roman Figures, the lines of the various classes of fracture, based on muscular attachments and actions. I. Interdepressor Fractures (Symphysis). II. Pre-elevator Fractures. III. Inter-elevator Interior Fractures. IV. Post-elevator Superior Fractures. V. Post-elevator Fractures (Condyle).

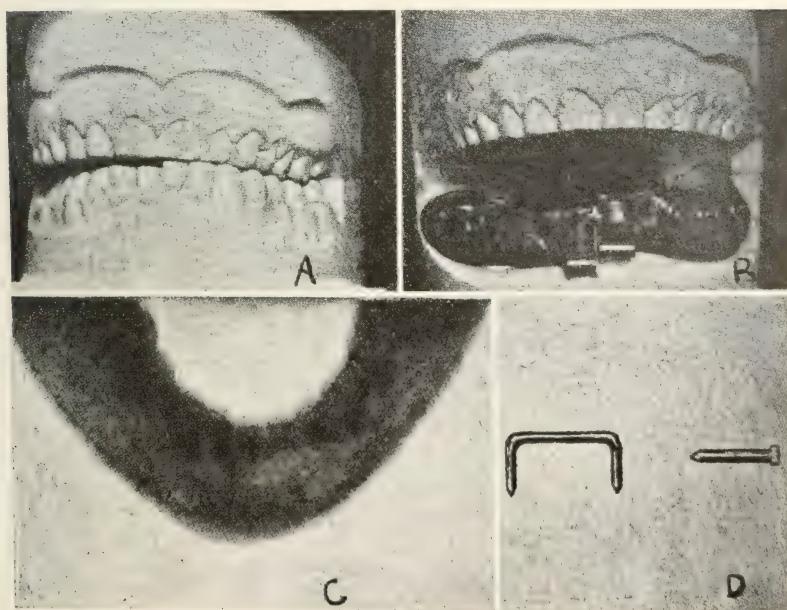


Fig. 22. An example of Interdepressor Fracture without Loss of Bone and with displacement of parts. A. Cast of case before treatment. B. Appliance in place. C. Locking pins for locking halves of appliance in place after approximation of fragments has been secured. D. Locking pins for locking halves of appliance in place after approximation of fragments has been secured.

black copper cement. Pressure is exerted against each of the fragments toward a position of complete reduction, and as space is gained the ratchet acts, and the parts are held. Parallel relationship is maintained by means of a U-shaped piece of wire (Fig. 22, C and D) fitting in the parallel tubes on the lingual of this appliance, and, as soon as complete reduction is secured, the parts are locked by means of the locking device (Fig. 22D) and the patient dismissed. Digressing a little, the lecturer spoke of the great advantage to be gained by appliances such as the foregoing, the design of which allowed the patient to leave the hospital and either engage in light work or return home, returning to the hospital at intervals for inspection or readjustment of the appliance.

Inter-Depressor Fracture.

B. With loss of substance.

As an example of this unfortunate condition the lecturer showed casts carrying an appliance through the action of which bone was actually grown. The loss of bone was as shown (Fig. 23, A, B and C) between the lower bicuspid, and the appliance consisted of actually grown. The loss of bone was as shown (Fig. 23, A, B and C) between the lower bicuspid, and the appliance consisted of two cast "gutters" exposing the inclined planes of the teeth. (Fig. 24, C.) Along the buccal sides of these gutters were soldered vertical tubes to which were attached either jack screws or elastics for the purpose of slowly moving the fragments apart. (Fig. 24, A.) Transversely across the space between the bicuspid at which place the entire section of bone bearing the anterior six teeth was lost were soldered interlocking flanges with holes 3 mm. apart. The inter-locking character of this arrangement as seen in Fig. 24, A and B, prevents vertical friction, which destroys bone formation. By means of either jack screws or elastic rubber bands the fragments are moved apart 3 mm. every interval (from a fortnight to a month). This movement results in the formation of a fibrous tissue, which calcifies and becomes bone. (Fig. 23, D, E and F.) Most remarkable results have been obtained in literally growing bone by means of a slow separation of fragments in otherwise healthy patients.

In this connection many cases present in which the loss of bone may be so great as to make such artificial production of bone impossible. In such cases otherwise indicated surgical assistance becomes necessary, and in the hands of the surgeon the bone graft and its wonderful results, and still more wonderful possibilities, are too well known among the dental and medical profession as well to need no further comment.

Pre-Elevator Fractures.

A. Pre-Elevator Fractures without loss of substance.

An example of this condition is shown in Fig. 25. Impressions are

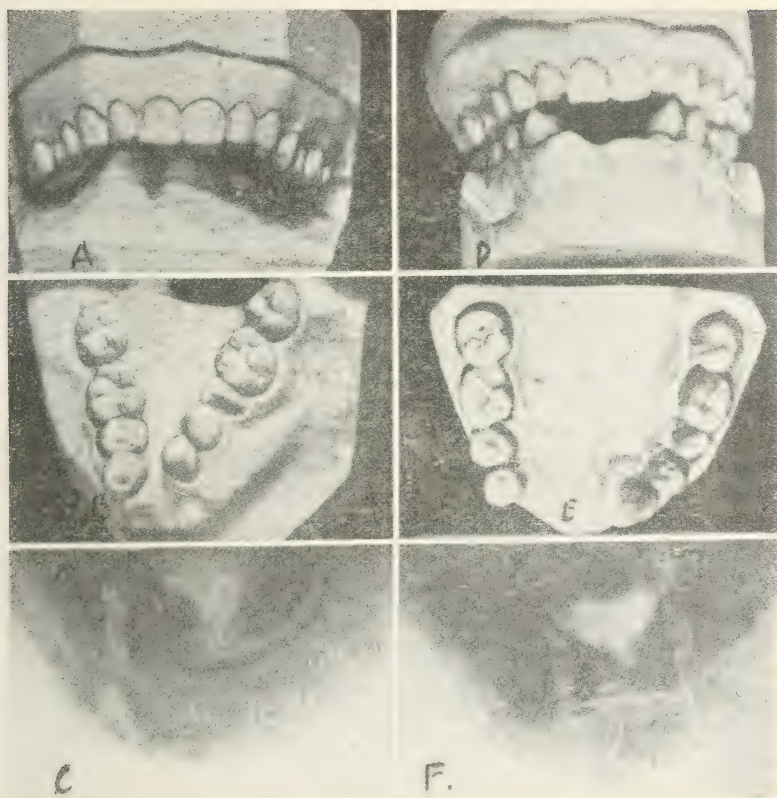


Fig. 23. Showing an example of an Interdepressor Fracture with Loss of Substance. A. View of casts of the case before treatment from the anterior, and B, same from above showing large Loss of Substance. C. Skiagraph before treatment. D. Case after treatment. E. Same as seen from above, and F, showing Skiagraph of completed case. By gradual movement of the fragments of bone away from one another new bone was actually grown in this case shown in F.

made of upper and lower, and casts are made. Two thicknesses of Ash's thin wax are adapted, and at the point of fracture are divided, and cast separately, leaving the occlusal inclined planes exposed. These castings are mounted upon the separate fragments of the fracture, and the fragments brought to proper occlusion. An impression of these two castings is then taken on their buccal side, then removed with the two castings in situ in the impression, invested in a refractory material and assembly made with vertical and horizontal locking pieces fitting in tubes joined to the gutters with solder. This having been accomplished, and the assembled splint is polished, the splint is cemented to the teeth with Ame's black copper cement (Fig. 26) and with or without an anesthetic the reduction of the fracture is made, and the locks slipped into place.

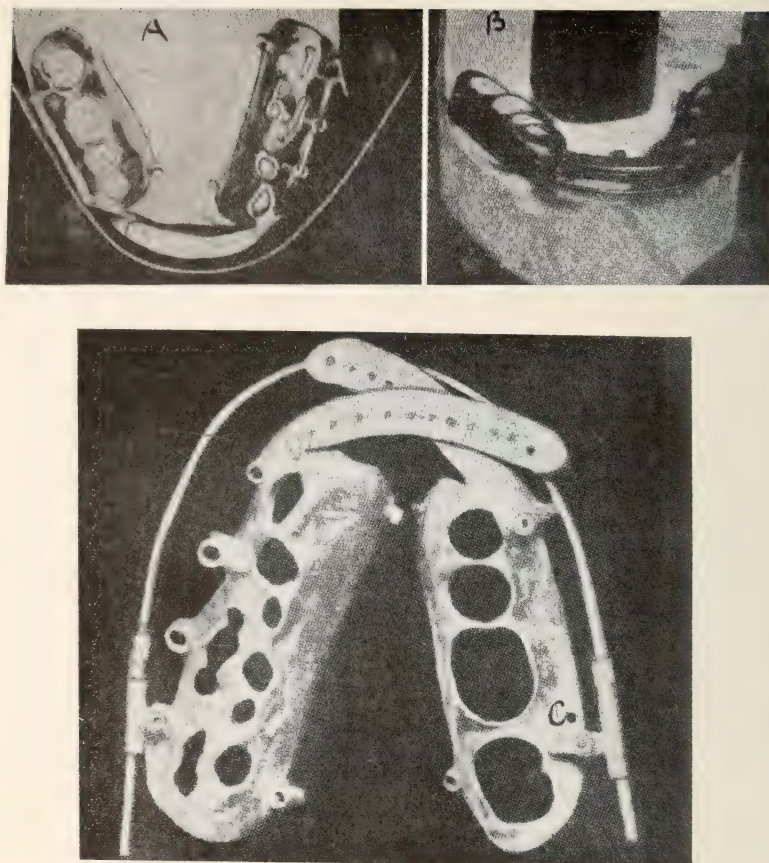


Fig. 24 A, B and C. Showing different views of appliance by which result in Fig. 23 was secured.

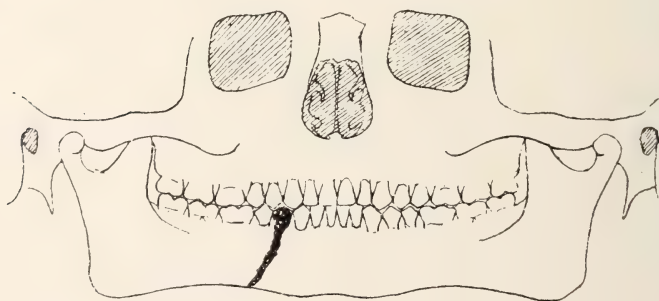


Fig. 25. Schematic Representation of a Pre-elevator Fracture, without Loss of Substance.

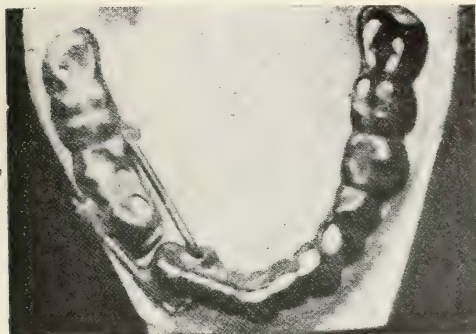


Fig. 26. Splint made in two sections, each section attached to each fragment, the fragments moved together with or without an anesthetic and held with Vertical and Horizontal Locking Pins.

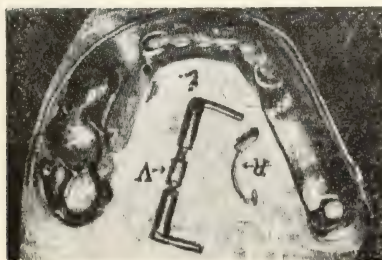
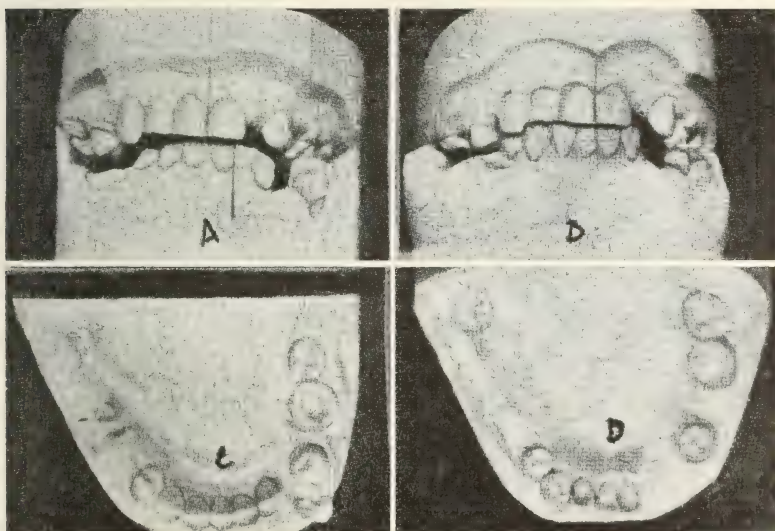


Fig. 27. Casts of a Pre-elevator Fracture with Loss of Substance in which Bone is Artificially Stimulated as in Fig. 23. A and B. Casts of case before treatment. C and D. Casts of same case after treatment. Note new tissue formed. E. Appliance based on Jackscrew by which result was secured.

B. Pre-Elevator Fracture With Loss of Substance.

An example of a bone growing appliance similar to Fig. 23 was shown in this connection. Impressions were made and "Gutters" cast leaving the occlusal inclined planes exposed as before. These gutters were mounted upon each fragment, upon a cast, and by means of jackscrews as shown (Fig. 27, E), the fragments in apposition are gradually moved apart, with the remarkable result as seen in Fig. 27A, B, C, D.

Inter-Elevator Fractures.

An example of this class of fractures was shown with loss of substance and without teeth upon the distal fragment (also shown by Ccl. Hume). An appliance was made, following the general plan as outlined, with cast "Gutters" exposing the inclined occlusal planes, and with a "Villian Pseudo arthrose." (Fig. 27.) Under this general term comes a remarkable system of simple mechanical movements, chiefly cranks with variations, which when loss of substance has occurred produces physiological movement of the remaining parts. This principle is new and original with Dr. Villian, and has revolutionized the treatment of these fractures in the posterior region having loss of substance, and consequent displacement of both wounded bony and muscular parts. In this particular case the pseudo arthrose consists of a threaded rod telescoping into a tube with an eye at each end, forming a type of crank as described. Fig. 27, F, shows the result of this crank appliance in producing a physiological position and consequently an approximate physiological function.

Post Elevator Fractures. (Condyle Fractures.)

It is within this division that the most remarkable results are secured under circumstances of injury which would at first glance seem almost hopeless. Two cases were shown of this division, without and with loss of bony substance.

Post Elevator Fractures without loss of substance.

These fractures occur most frequently at the neck of the condyle, and the plan of action is the use of an apparatus which will guide the mandible in its physiological movements, which results in an approximate apposition of the parts, inasmuch as no appliance outside of that of a surgical nature buried in the tissues could be used to hold these parts together. In the first case shown there was no appreciable loss of substance, impressions were made, and full cap splints, upper and lower, developed as in Fig. 28. Upon the upper as shown in Fig. 29 a flat plate is soldered to the buccal side, and to the lower a tracing point is fastened. Black wax is then applied to the flat plate on the upper, the jaw guided by hand in correct open and closing movement, and a tracing made upon the flat plate by this process, which is familiar ground for those who have followed Pro-

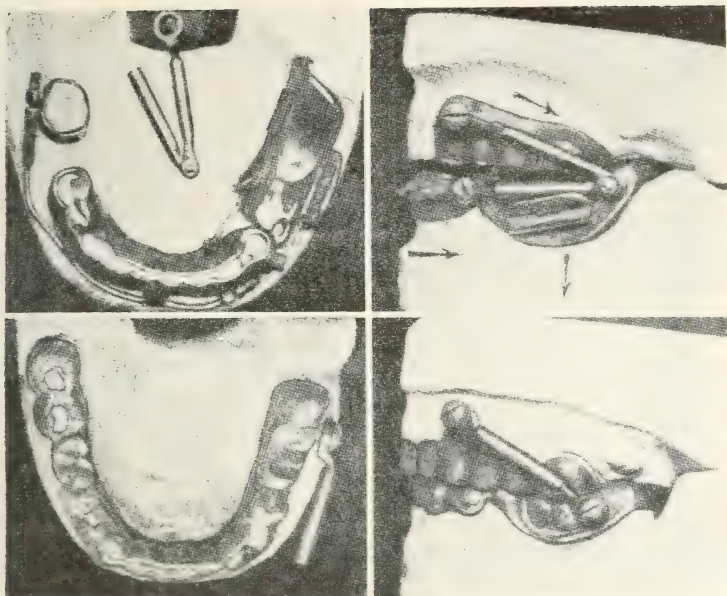


Fig. 27 F. An example of a Villian Pseudo Arthroze, with one fragment without Teeth. A link motion which keeps the anterior fragment in place and also depresses the posterior in its tendency to rise.

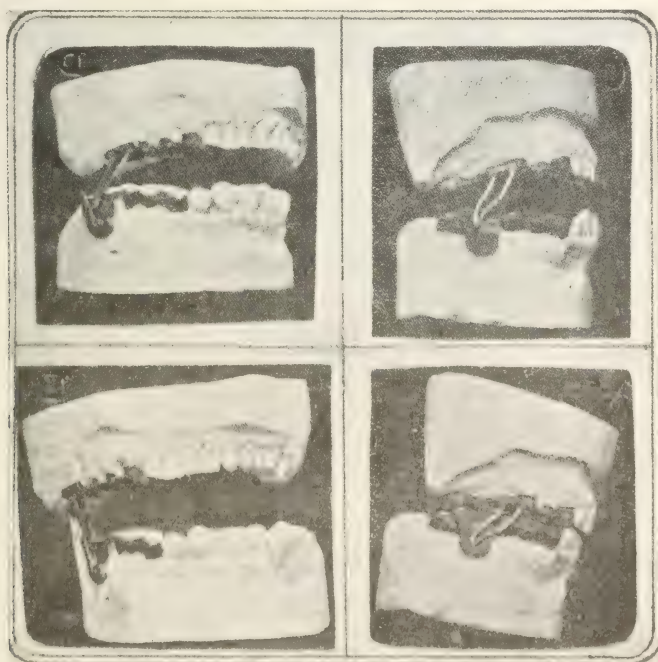


Fig. 28. Different positions of Villian Cinematique. A. Position at rest. B. Lateral movement. C. With mandible depressed. D. With mandible laterally depressed. Cinematique is indicated in Post-elevator Fractures without loss of substance.



Fig. 29. Obtaining tracing for Cinematique. Tracer is attached to Mandible operating on a vertical plate fastened to the "gutter" for the Maxilla and covered with black wax. Mandible then depressed by hand and tracing (used in profiling Cinematique) thus secured.

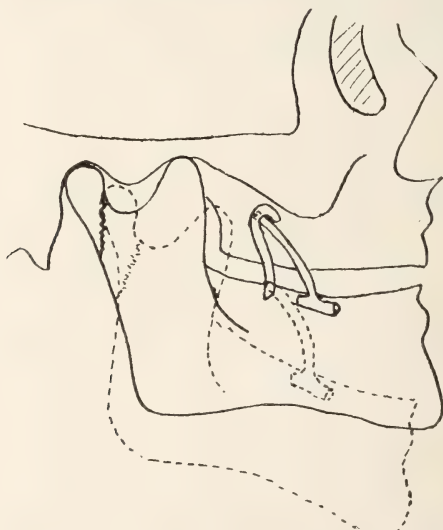


Fig. 30. Diagrammatic representation of profiled Cinematique in depressed position of the Mandible. See Figure 29.

fessor Gysi's methods of anatomical articulation, it being somewhat similar to his plan of location of the rotation centres by the Gothic tracing. From this tracing a profiled trough is developed and superimposed on the plate into which fits a hinged guiding piece engages. (Fig. 28 and 30.)

The object of hinging this guide piece to the lower splint is to permit side movements of the lower jaw (Fig. 28), impossible if this piece were rigid. When this assembly is cemented into place

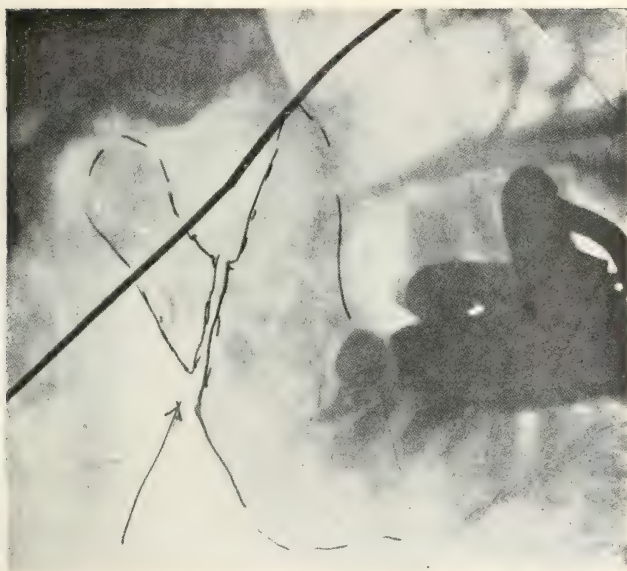


Fig. 31. Skiagraph of Post-elevator Fracture without loss of substance, for which Cinematique is indicated.



Fig. 32. Case as shown in Figure 31 with consolidation complete. The action of the Cinematique holding, by physiological action of the muscles, etc., the parts in apposition.

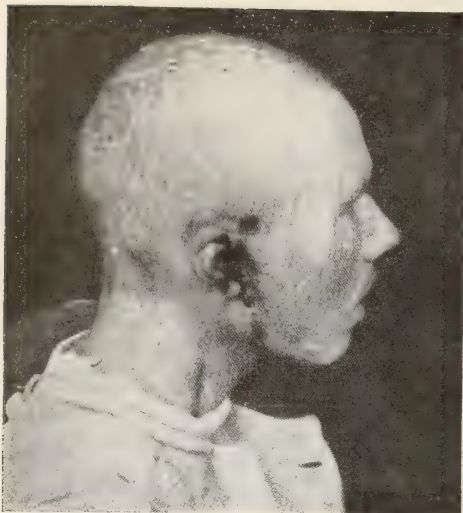


Fig. 33. Surface view of injury resulting in considerable loss of tissue in the Condyle region.

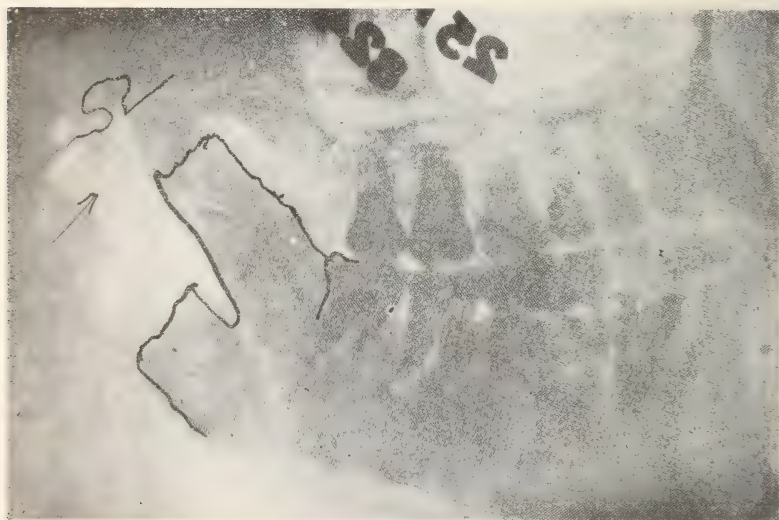


Fig. 34. Skiagraph of injury shown in Figure 33. The entire distal section of Mandible missing.

the result is a physiological movement of the body to the maxilla, which results in bony union in a comparatively short time, four months. (Fig. 31 and 32.) Digrammatic action of this mechanism called "Guide Butoir." (Fig. 30.)

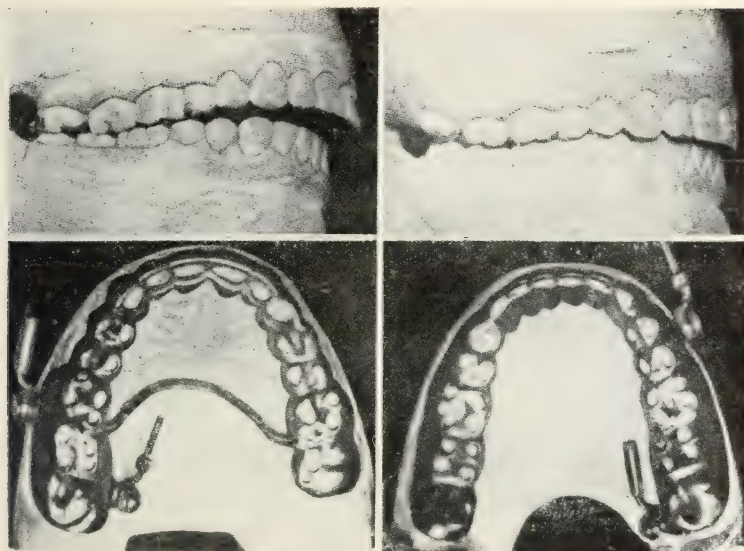


Fig. 35. Upper left hand drawing, occlusion of teeth when patient entered hospital. Upper right hand drawing, occlusion of the teeth, completed case. Lower left hand drawing, upper half of "gutter" or full cap splint showing inclined planes of teeth exposed and double pseudo Arthrosc. Lower right hand drawing, other section of same, exposing planes of lower teeth.

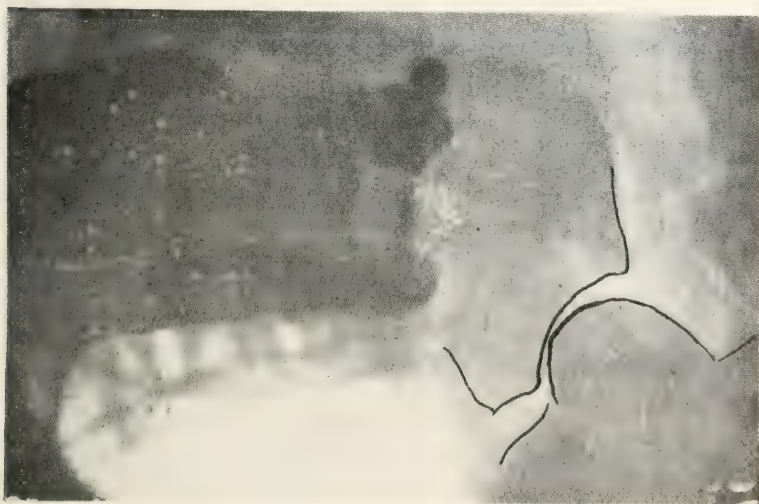


Fig. 36. Showing an approximation of the temporal maxillary articulation produced by the use of pseudo Arthrosc, Figure 35. Compare with original condition, Figure 31.

Fracture Post Elevator with loss of substance.

In this connection remarkable results are shown in which cases the entire loss of the condyle and consequent loss of the temporo-

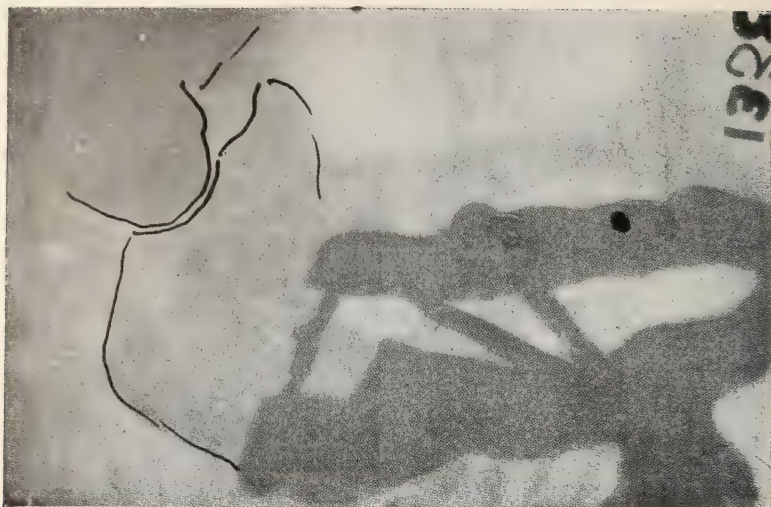


Fig. 37. Skiagraph showing Figures 34 and 36 with Mandible depressed, showing also shadow of appliance in place.



Fig. 38. Surface condition, patient shown in Figure 33.

maxillary articulation is sustained. Of such a case is that shown in Fig. 33 and 34. Entire full cap splints are made, upper and lower, and a double crank system soldered to these. (Fig. 35.) The skiagraphs show the remarkable result of this artificial physiological movement inasmuch as a new temporomaxillary articulation forms, with which the patient is able to function. (Figs. 36 and 37, 38 and 39.)

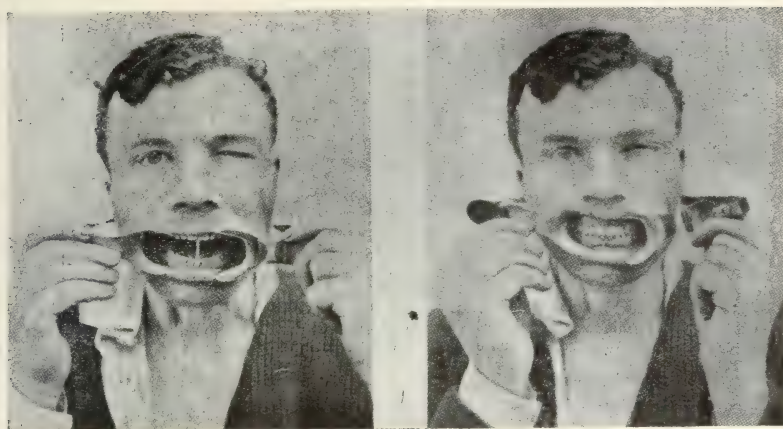


Fig. 39. Occlusion, same patient as Figure 33.

(Major Cummer's Article will be Concluded in the March Issue.)

Preventive Orthodontia in Early Childhood and the Management of Children*

HERBERT A. PULLEN, D.M.D., BUFFALO, N.Y.

LOOKING backward from the present day practice of early treatment of malocclusion, it is a far cry to the days of almost a quarter of a century ago, when the patients of the few orthodontic specialists consisted entirely of adults. The diagnosis and treatment of developing malocclusions in children had hardly been touched upon at that time, and the common advice of the dentist to the parents of children afflicted with malocclusion was to "wait until the permanent teeth were all erupted" before any corrective methods were started, a sparring for time piece of advice that at least afforded the dentist who proffered it a chance to temporarily evade the responsibility of an intelligent decision in regard to a case, and, if the dentist was beyond middle age when he gave the advice he would in all probability have one foot in the grave and be incapacitated for active practice when the patient, grown up, and with the permanent teeth all erupted, should reappear for the treatment of the malocclusion.

Of a similar purport with intent to shirk responsibility by procrastination as a shield for ignorance is the advice to "let Nature alone and she will correct the malocclusion," with the result in most cases of the development of a serious malocclusion confirmed by long years of arrested or deficient growth of the dental arches, while the child

*Address delivered before the Toronto Dental Society at the King Edward Hotel, December, 1918.

is allowed to patiently wait without avail for Nature to begin her corrective operations.

Another fallacy of early dental origin is the theory of "extraction to make room" in the dental arch for teeth which are out of alignment. The advice thus freely given seems to have been handed down or inherited from one generation of dentists and their patients to another, so that, even at the present day, it not infrequently crops out in unthinking repetition of time worn and obsolete phrases such as have been quoted.

In order to contradict this erroneous advice it is necessary to substitute certain facts gained from long orthodontic experience for the fallacious theories presented at the beginning of this essay. To begin with, it must have occurred to the most casual observer of to-day that the chief aim of both medical science and its branch, dental science, has changed from curative to preventive methods of treatment.

If this aim is to be carried out consistently, it follows that in order to prevent disease or deformity the beginning of all preventive and prophylactic measures must be directed upon the human organism from the time of its earliest infancy. "From the cradle to the grave" has now become the motto of the health hygienist, and thus it is that the child, and its environment, its work and its play, but chiefly its health, is the centre of all absorbing interest in all branches of medicine, especially in orthodontia.

The ideal physical condition which we all have in our minds as possible for the child is represented by such a state of normality of bodily function and structure that there is no room left for disease.

This mental ideal of the normal, physically perfect child encompasses health, beauty, and happiness. When one considers the charm of a well proportioned and well balanced face, with a winning smile, and displaying a beautiful row of pearly teeth, as in Fig. 1, the mental picture becomes extremely fascinating.

Evidences of faulty respiration or of undeveloped and asymmetrical dental arches are inconceivable in the perfectly normal face; in fact, the whole external face reflects the evidence of an anatomically perfect internal face, with well developed dental arches, well developed nasal passages, and a healthy tonsillar ring. A step farther, and we may read as well a normally healthy body in its entirety, and a healthy mind, the expression of which is complete and care-free happiness.

Every mother desires such a delightful combination of health, beauty, and happiness for her children, and is willing to undergo any sacrifice to obtain it, but many mothers are doomed to disappointment, for either through hereditary influence or some acquired physical defects, the consummation of ideal physical perfection and beauty

seems impossible in child development in many cases, except under peculiarly advantageous circumstances.

The uncommonness of normal developmental conditions is illustrated by contrasting the harmonious and symmetrical facial lines in Fig. 1* with the lack of harmony and balance in the face shown in Fig. 2, the beauty of the face and of the smile being marred by the exhibition of a mouth full of irregularly placed teeth. It is unfortunate that the possessor of so natural a smiling countenance should have "to wait for Nature to straighten the crooked teeth" or for the permanent teeth to erupt fully before corrective operations are begun.

Beauty of the face is a composite of normally developed, well balanced features, and no one part of the face lends more attractiveness to this composite picture than perfectly developed teeth and dental arches, and no other part of the face can so deform and make ugly the lines of an otherwise beautiful face than the crooked, irregularly placed, or protruded teeth so often noticed in the mouths of children.

Let us examine another picture more extreme in its manifestations of oral and facial deformity, and less amenable to corrective treatment because of the more profound disturbance of bodily functions as a whole, a condition belonging to a type of cases which are occasionally observed in practice. The face shown in Fig. 1 is pathetically distressing with its open, drooping mouth, protruding teeth, and inharmonious facial lines, exhibiting a typical dullness of expression.

In this type of case the nasal passages are undeveloped, the nasal septum deflected, the turbinates enlarged, adenoids and enlarged tonsils are in evidence, the hearing is impaired and there is a muffled tone to the voice. Further examination of such a child usually reveals a narrow chest, and consequent lack of respiratory function, a stunting of growth and underweight, all evidences of a hard struggle for existence.

This is not an infrequent history, though in some cases it is perhaps less marked, of many of the children who are suffering from what has been aptly called the "vicious cycle" in the oral and nasal cavities.

However successfully the rhinologist can remove adenoids, tonsils and nasal obstructions for the restoration of normal nasal respiration and ventilation and drainage of the nasal sinuses, and the ophthalmologist relieve eye strain and assist in the proper correlation of eye functions, there still remains a further field of operations in orthodontia, which, because of its possibilities of assisting in the development of the internal and external face, because of its stimulation to bone building in the maxillae and superimposed structures of the nose, and its consequent restoration of the functions of nasal respiration and

*Dr. Pullen illustrated his address by a series of very excellent lantern slides. The figure numbers refer to these.

normal occlusion, bids fair to fill an unique and highly important place in its possibilities of further physical benefit to the child.

But at this point it should be emphasized that the greatest benefit from orthodontic treatment is obtained in the early years of childhood, when such pathological changes as arrested development of the maxillae of the nasal structures are first apparent, and before these conditions are confirmed by several years of mouth breathing with its many ills, and before abnormal development of the internal and external structures of the face have shut the door to the best opportunity for effective treatment.

The long continued effect of faulty respiration and lack of full function of the organs of the internal face, because of nasal obstruction, mouth breathing and malocclusion of the teeth is shown in the case of the adult in Fig. 4. The lines of the face are sadly out of balance, the teeth are protruded, and the chest is caved in. The case is manifestly too mature for ideal treatment, for although improvement in occlusion might be obtained, the bone is too dense for development of the dental arches and superimposed nasal structures, and it is obvious that the patient has waited too long before commencing corrective treatment.

In Fig. 5 is exhibited the treatment of a young child having the same type of malocclusion as the preceding case, with very pleasing results in obtaining better breathing conditions, a relief from the dull expression of mental hebetude, and the restoration of beauty to the face.

It must be evident to the close observer that malpositions of the teeth, generally speaking, are but objective symptoms of abnormal development of the dental and maxillary arches, usually exhibited in an arrest or deficiency of development, such as contracted arches with not enough room for the permanent teeth to erupt without crowding some of them out of alignment. Fig. 6 illustrates a simple case of deficient development of the dental arches, causing crowding of the teeth and overlapping in their effort to erupt in dental arches which are too small for them. A consistent corrective treatment should have been begun before the age of twelve, when this case presented for treatment, but a very pleasing result in the development of the dental arches and restoration of normal occlusal relations was obtained.

Whether or not the general practitioner of dentistry ever practices orthodontia, it is essential for his professional reputation that he does not err in his advice to parents regarding the incipient malocclusions in their children's mouths, but he should either institute corrective measures himself in these cases or refer them to the orthodontic specialist as early as the malocclusion becomes evident.

The time when corrective treatment should be begun has somewhat definitely arranged itself. Since the roots of the deciduous

molars enclose the crowns of the permanent bicuspid, as observed in Fig. 7, any lateral pressure exerted in the expansion of the deciduous arch is transmitted to the permanent bicuspid, and it is therefore advisable to begin operations for the expansion of the deciduous arch some little time before the loosening of the deciduous molars preparatory to their being shed, or else the looseness or absence of these deciduous teeth will postpone any attempts at arch expansion until the full eruption of the bicuspid, some time later.

Thus, in the anterior development of the lower dental arch shown in Fig. 8, begun at the age of eight years, the deciduous cuspids and molars were intact and their roots had not begun to absorb, so that they afforded a firm support for the appliances adjusted for anterior arch expansion necessary because of the closing up of the erupting space of the permanent lateral incisors, due to the premature extraction or loss of the deciduous lateral incisors.

Premature loss of the deciduous teeth in this manner should be provided for by the mechanical retention of the space necessary for the eruption of the permanent successors, otherwise the dental arch will contract in the spaces of these teeth, leaving no room for their eruption. The banding of the deciduous cuspids, and connecting these bands by a lingually soldered retaining wire, would have prevented the malocclusion from developing, and is an operation that any dentist can easily perform.

The premature loss of a deciduous molar in the case shown in Fig. 9 caused the contraction of the lower dental arch, and resulting malocclusion of the upper arch. In the event of the premature loss of a molar in the deciduous arch, as occasionally happens through necessary extraction, it is always advisable to guard against the subsequent contraction of the dental arch by holding the space of the lost tooth open by means of bands on the teeth on either side of the space connected by a lingual wire, such as is shown on the after treatment cast in this figure. In this case this was not done, the lower arch contracted, and it was necessary later to expand and develop both dental arches to correct the resulting malocclusion.

The prolonged retention of deciduous teeth works almost as much havoc in the developing permanent arch as the premature loss of these teeth, and the mouths of children should be carefully watched for such abnormal conditions. The most common instance of this condition is observed in the retention of the lower deciduous central incisions beyond the time for their natural absorption, their roots being unabsorbed and deflecting the erupting permanent centrals lingually as illustrated in Fig. 10. If there is room for the permanent incisors to erupt, the only operation necessary is the extraction of the deciduous centrals when the permanent centrals will of their own volition grow forward into the space.

In the cases shown in Fig. 11 the prolonged retention of the de-

ciduous lateral incisors has deflected the crowns of the permanent laterals lingually, indicating the necessity for the immediate extraction of the deciduous lateral incisors, and possibly the slight expansion of the dental arches to obtain sufficient room for the eruption of the permanent lateral incisors into position.

The prolonged retention of the deciduous cuspids or of the first or second deciduous molars, when there is no evidence of the approaching eruption of the permanent successors, is a matter of some concern, since the germ of the succeeding permanent tooth is occasionally absent, and the extraction of one of these teeth, without an X-ray diagnosis, showing the presence of the succeeding permanent tooth, would be questionable practice. In the absence of a permanent successor, as shown by the X-ray, the deciduous cuspid or molar usually does not suffer from the absorption of its root, and may do good service for a lifetime if properly cared for.

Fig. 12 illustrates a case in point in which the dentist consulted me as to the advisability of extracting the deciduous second molars, they having been retained beyond the period of their natural loss. I made a radiograph of both lateral halves of the upper dental arch, as shown in Fig. 13, and finding the permanent second bicuspid missing, advised the preservation of the deciduous second molars, and they have done good service for many years since the advice was given.

Supernumerary teeth are not infrequently the causes of malocclusion, which the dentist can prevent by the extraction of these teeth before they can cause a deflection or transposition of the permanent teeth. The two supernumerary teeth shown in Fig. 14 were extracted before the eruption of the permanent central incisor, which was prevented from erupting by their presence.

Occasionally a supernumerary tooth will erupt alongside the normal tooth, which it will very closely resemble, and, as in Fig. 15, in which the normal lateral and the supernumerary lateral are so much alike in the form of their crowns that it was necessary to make a radiograph of their roots to determine which one to extract and which one to preserve.

The extraction of the first permanent molar is a common cause of malocclusion, for, as shown in Fig. 16, the teeth on either side of the space of the lost first molar drift into the space, and the dental arches collapse, causing malocclusion, in the same manner that an arch of masonry collapses when the keystone is removed. If I could leave with you one thought which I would wish to impress more than another it is this—Guard the first permanent molar from the ravishes of caries from the moment of its eruption until it is safe from caries in the sulci and from caries caused by contact with the too often carious distal surface of the second deciduous molar. It has been my experience that altogether too many first permanent molars have

been lost, with consequent serious malocclusions resulting because of the lack of frequent dental care of these teeth.

Having pointed out a number of the so-called local causative factors of malocclusion, and suggested methods of prevention of serious malocclusion resulting therefrom, I wish to say a few words as to the management of children in office practice. It might be asked why it is that the dentist often dreads the necessary visits of children, while the orthodontist looks forward to their coming with pleasure. The reason for this is probably because the dentist's work is associated with more or less pain, while the orthodontist is able, through the use of delicately constructed and skillfully applied appliances, to avoid pain. If it were possible for the dentist to fill the cavities of deciduous teeth without any more pain than the orthodontist causes in fitting bands to the teeth, the children would not be so averse to the dental chair, and the dentist would take more pleasure in his work for the children.

There is a difference in the way different dentists handle children also; in a community one or two dentists will get a reputation for the skillful handling of children, due, no doubt, to their love for or better understanding of children, and for their avoidance of pain in caring for their teeth.

Fear, if present, should be banished at the first visit of the child, and, once banished, it should never be allowed to return through any rough handling or carelessness on the part of the operator. Tears are always near the surface in children, and are always the signal for an immediate armistice and cessation of hostilities as it were, when the cause of the tears may be discovered, and by means of a diversion of a frivolous nature, equilibrium of emotions is once more restored, and the work finished with a careful avoidance of the incident which caused the tears.

It is all a matter of psychology in dealing with children; their minds are like an open book, very impressionable, ready for suggestions of a nature which will interest and please them, and if their thoughts are directed in the right channel they will forget that they are in a dental office, and will fill the office with their sunshine and laughter, and often drive away a fit of the blues.

Can you imagine a child with a mouth full of a plaster impression laughing until the tears ran down its cheeks? That happened in my office this last week, and was a pleasant diversion, although an impression need never cause any fear or disagreeable sensations if carefully and scientifically done.

Find out what is occupying the child's interest at the time, and converse with it on that subject, adding the ideas which it is looking for, stimulating its enthusiasm, thus proving to them that you are deserving of their confidence, and in the meantime, gaining their friendship.

Often a child will come in with a big idea; help him along with it. He will forget all about the office and everything that might be disagreeable about it in a few minutes, and your work will go along smoothly to its completion without a ripple to mar the surface. To illustrate, one of my little patients, a boy who usually has to be constantly watched because of his fidgety actions and boisterous behavior, announced to me when he came in the other day that he was going to be an inventor, his father having bought him a bench with a number of tools to work with. He and his companions had formed an inventors' club, and were going to invent things and make some money on them. I immediately encouraged the idea, showed him some inventions of my own, and, finding that he did not know what to invent first, suggested to him that I needed a small white enamel waste receiver attached to the cabinet, to be worked with a foot lever much as a surgeon's waste receiver is operated.

He fell for the idea at once, saying that his mother had an old flour can which he could use to start with, and when they got things going they would give me one, I having told him of the possible great demand for them by the dental trade, and of the possibility of making some considerable money in selling them. We have established a relationship of camaraderie, based on business presumably, which will probably last until I can complete his case, but giving me a control over his actions which I could not so easily obtain any other way.

Suggest to the children the subject of conversation while in the office, and, if you are keen, you will find a way to interest them along lines they unconsciously suggest to you.

The mysterious always appeals to them, and a few sleight-of-hand tricks will not come amiss. Lighting the gas with a pencil attached to the electric lighting current never fails to elicit their interest and admiration. Pumping up the chair or running the dental engine often serves a similar purpose.

Stories have a remarkable effect, and it is well to keep a stock of them on hand for purposes of diversion. The office magazines should be chosen with the idea of interesting the children rather than the adult entirely. Even the furniture may be selected with a view to their needs, especially in an orthodontist's office.

It must be remembered that the child lives in a little world of its own, a world of effervescent joy and happiness, a combined mixture of birthdays, Christmas and other holidays, bed-time stories, candy, cake and ice cream, picnics and games.

For the adult to enter their little world means the discarding the mask of maturity, and donning the mask of youth, entering through the gateway of sunshine and laughter, frivolity and mirth, affection and sympathy, and conducting a children's hour in the office with

that supreme understanding of the heart of a child that is expressed so nobly in the words of Longfellow:

Come to me, O ye children;
 And whisper in my ear
 What the birds and the winds are singing
 In your sunny atmosphere.
 For what are all our contrivings
 And the wisdom of our books,
 When compared with your caresses
 And the gladness of your looks?
 Ye are better than all the ballads
 That ever were sung or said;
 For ye are living poems,
 And all the rest are dead.

* * * * *

Dr. George W. Grieve of Toronto opened the very interesting discussion which occurred following Dr. Pullen's address.

Dead Teeth Lead to Dead Owners

[Under the above title the Toronto Mail and Empire editorially deals with the cause of the death of the late Theodore Roosevelt. The article sums up the whole matter in the closing sentence, "The responsibilities of the Dentist are increasing. It is well to bear in mind that a pulpless tooth is not necessarily a 'dead' tooth."—Editor.]

ONE of the most striking features about the late Colonel Roosevelt was his teeth. When he smiled, he showed most of them. When he made a point in a speech he was accustomed to snap them together. They were large, white and even. Yet it now appears that Roosevelt's death was due to a diseased tooth. The direct cause of death was a pulmonary embolism, that is to say, a clot of blood that was carried through an artery to the lungs, where it stopped circulation. The creation of this clot, however, was due to an infected tooth more than twenty years ago. Through the diseased tooth a malevolent organism entered the system and manifested itself in various ways on several occasions. Eventually it created the blood-clot which carried off the greatest of contemporary Americans when he appeared to be in his vigorous prime. This statement is made on the authority of Henry James Buxton, in the Philadelphia Public Ledger, who uses it as a text to call attention to the great importance that is now attached to healthy teeth by medical authorities.

MODERN DENTISTRY.

Until quite modern times the general idea was that the only risk one ran with a bad tooth was the risk of toothache, and toothache was often treated as an unavoidable ill. When a tooth ached too badly it was yanked out. When several teeth had been lost in this manner the custom was to have the remaining ones extracted and their place taken by a set of store teeth, preferably of a pale blue tint. These teeth, in two sets, were removed at night and deposited in a glass of water, and more than once it has happened—but that is another story, and not any too pleasant. In late years dental science has made many discoveries about teeth. It has found, for instance, that in hardly any circumstances is it wise to extract a sound tooth. It has discovered the wisdom of filling the first teeth of children. It has performed miracles in the way of crown and bridge work, and now it is coming to the conclusion that the pride it took in much of this work was false pride, and that a crowned tooth is a danger, that toothache is the smallest of the ills that attend an insanitary state of the mouth, that the proper care of the teeth may be a matter of life and death, that indeed thousands of people die annually as a result of infections that enter the body through diseased teeth.

AMERICAN AND CANADIAN TEETH.

Rheumatism and infections of the heart, kidneys and intestines are often closely associated with the condition of the teeth. For example, it has been learned that these afflictions were most common in the Austrian and Italian armies in which dental science was least advanced. The writer claims that the American army went to the front with the best teeth of any army in the world, all filed and set, as it were. This claim may be disputed. No army had any superiority over the Canadian army with respect to the health of the men's teeth. If the American soldiers were as well attended to, that must be the limit of their claim. It is not necessary to argue, of course, that in the United States and Canada there are the best dentists in the world, that the average teeth are better cared for than in any other civilized countries, and that the importance of sound teeth is understood by almost everybody, since the dental principles are taught in school. But even here, it appears, there is much to learn.

DEAD TEETH DANGEROUS.

For instance, the famous Dr. C. H. Mayo, of Rochester, Minn., says that "a crowned tooth is not a crown of glory, and may cover a multitude of sins." The really dangerous tooth is the dead tooth, the tooth from which the nerve has been removed. This tooth cannot ache, nor form an abscess, but there is always the possibility of germs remaining in it and laying the foundation for some illness that may incapacitate or cause the death of the victim, and he have no reason at all to suspect the cause of the trouble. On this account some

medical men and dentists are now advocating that every devitalized tooth should be removed from the head. Tonsilitis, earache, inflammation of the nasal cavities, deafness, eczema, rheumatism, blood poisoning are a few of the ills that modern science has traced to teeth that have never ached but that have harbored germs. One authority mentions a case of obstinate deafness in a middle-aged woman which was completely cured by extracting the roots of a couple of teeth.

IMPORTANCE OF X-RAY.

In discovering the cause of some mysterious maladies the X-ray has been of great assistance. By its aid, Dr. Mayo says, the presence of alveolar, absorbed roots of teeth or absorbed bone without the teeth, have been detected when there was no other indication that there was anything amiss in the mouth. He points out that the one place in the body in which man quite regularly, if not invariably, carries bacteria, is the mouth. On this account there is no other part of the body whose constant attention is so important. Another doctor observes that the modern dental surgeon must look beyond the little problem of saving a patient's tooth to the greater question of saving him from a serious or perhaps fatal infection. Regular brushing of the teeth, and rinsing of the mouth with some mild antiseptic, inspection by a competent dentist once or twice a year, will go far to maintain the teeth in good condition, but it will require an X-ray examination to determine whether a dead tooth that has given no trouble for years perhaps, should be permitted to remain in the jaw. The responsibilities of the dentist are increasing.

Dominion Dental Council of Canada

OFFICIAL notice has been given by the Dominion Dental Council of Canada that the time in which to make application for a Class C certificate has been extended until June 30th, 1919. This class applies to those who have been engaged in regular legal ethical practice, in an agreeing province, for 10 years prior to December 31st, 1918, and who were registered in one of the agreeing provinces prior to January 1st, 1917.

Notice is also given that applications for Class D examination must be in the hands of the Secretary on or before 1st May, 1919. The examination commences on the second Tuesday in June, and is intended for those who have been in practice as above, for a period of five years prior to 1st May, 1919.

All the above applications, accompanied by the required fee of one hundred dollars, must be sent to the Secretary, Dr. W. D. Cowan, House of Commons, Ottawa.

Dental and Medical Needs in China

CHAS. F. SERVICE, B.A., M.D., OF CHENG TU, WEST CHINA.

THE health of a nation is one of its greatest assets. The medical and dental professions are an integral part of the life of all civilized lands. The members of these two professions are recognized by all citizens as holding an honoured and indispensable place in the national life. But uncivilized and non-Christian are not thus blessed.

China's millions are needy millions. From whatever point of view one views China the word *needy* stands out prominently. This is emphatically true from the physical standpoint. Here, certainly, is a situation crying aloud for succor. During these years of war nothing has stirred us so deeply as the thought of the great sum of human suffering in Europe. We have read of the countless cases of infected wounds, blindness, etc., and we have been stirred to the deepest sympathy; we have poured out our millions for Red Cross work, etc., and have sent our doctors and nurses without stint to Europe.

But suffering does not end with the war zone. The Chinese have been sufferers for milleniums. Almost every ill that human flesh is heir to may be found in China in aggravated forms. At least 16,000,000 of Chinese die annually from preventable causes. At least 80 per cent. of wounds in China are infected, due to ignorance, neglect, filth, absence of trained medical profession, lack of Christian teaching and moral restraints. While the few Western medical practitioners in China annually have about 3,000,000 treatments and perform thousands of operations, most of the cases treated are advanced. But the hundreds of millions are left to suffer without skilled treatment. The native practitioners, though numerous, are untrained, and can relieve only common ailments. In the face of epidemics, plagues, surgical conditions and other serious illnesses they are powerless. The medical missionary force in China at any one time numbers less than 400, or about one for every 1,000,000 people.

Tragic as is this medical situation, the dental situation is manifestly worse. Western dentists in China are very few indeed when compared with Western doctors. In all of Western and North-Western China, embracing over 100,000,000 people, there are only three Western dentists. In all China, with her 400,000,000 people, the Western dentists can be numbered on the fingers of one hand.

All members of both the medical and dental professions know how essential to health is a healthy condition of the mouth. During recent years great stress is being laid on that point. Hence, wonderful progress has been made in dental science in the use of the X-ray in the treatment of pyorrhea.

Now every doctor who has practised medicine knows that there is not a healthy Chinese mouth in that great land. He sees thousands of them every year. How could there be a healthy oral condition in any one individual in China? The teeth require care both from the individual himself and from a dental surgeon. Fortunately as one result with long contact with foreigners, many Chinese are beginning to use tooth powders and the tooth brush. This is certainly some improvement and holds out promise for the future. The Chinese are willing to learn.

In the far distant part of China, known as West China, are now three dentists, one of whom, Dr. Mullett, is a recent arrival, and is still engaged in the study of the Chinese language in preparation for future work. Doctors A. W. Lindsay and J. E. Thompson are the only two engaged in actual practise in that immense region of China. These men are all graduates of the Toronto Dental College, and are no doubt well known to hundreds of dental surgeons practising in Canada. You may rest assured that they are the "right men in the right place." If ever men worked hard, they do; if ever men had boundless opportunities, they have; if ever men had a great vision, they have. They all feel overwhelmed with the situation, and feel as we medical practitioners do, that the only solution of their problem lies in the line of dental education for thousands of Chinese young men. They therefore propose (and we medical men heartily second the proposal) the establishment of a dental faculty in connection with the medical college which is a part of the West China Union University. It is hoped that their confreres in Canada will take a keen, a definite and practical interest in the establishment of this much needed institution. Such provision for dental education in West China will be an invaluable piece of construction work for that great land. It will furnish an opportunity to provide leadership for a much needed profession in China—a leadership trained under Christian auspices and inspired by high ethical ideals.

Food Enzymes : Essential Factors of Complete Nutrition

BY THOMAS G. READ, D.M.D., HARVARD, L.D.S., ENG.

THE effects of the actions of the enzymes were first studied by the brewing industry, which at the beginning was concerned in the enzyme diastase or amylase of malt, and then in the enzymes of yeast.

The pathology of beer was so unfolded that diseases to which it was liable are now practically eliminated.

The enzyme diastase or amylase was first observed in 1814 to be responsible for changing starch into sugar, and in 1831 it was dis-

covered that saliva possessed a very similar property, which is due to the enzyme ptyalin contained in the saliva. It is a great pity the matter was not then further investigated, because it would have been found that conversions by enzymes contained in the human organism are not sufficient alone to maintain complete nutrition. When the enzyme amylase of starchy foodstuffs has been destroyed before acting, no conversion of starch into sugar takes place during cooking, and when this food reaches the mouth starch is converted by the enzyme ptyalin of the saliva into sugar. Lactic acid is rapidly formed from this, forming sugar by acid-producing bacteria, which are always present in the mouth. Ptyalin and acid-producing bacteria are swallowed with the bolus of starchy food, and the formation of lactic acid continues for some time. The lactic acid combines with alkaline bases. The neutral salts formed are excreted by the kidneys and skin, and the body deprived of essentials of complete nutrition.

Forming or nascent lactic acid has a great affinity to combine with lime salts. Thus, besides doing harm while passing through the system by combining with alkaline bases, there is also a great tendency for nascent lactic acid, while forming in the mouth, to combine with lime salts of the enamel of teeth and start dental decay.

Over fifty enzymes are now known to exist, of which the individuality and mode of action have been described. The French have the soundest teeth in Europe. The bread of France is still the Staff of Life, because it is made from flour containing the unimpaired enzymes of the grain.

Our war bread is most indigestible and harmful, because our enzymes of the grain are destroyed by millers while making our war flour. Thus when water of a temperature of about 80 degrees F. is added to the flour, no conversions by the enzymes amylase and cellulase of the germ take place to render starch and cellulose soluble, that they may be digested, and no action of the enzyme cerealin of the aleurone layer takes place, analogous to trypsin of pancreatic juice, by converting the protein of the grain into soluble peptones.

The change of our bread from the Staff of Life to the present degraded bread we are now supplied with dates from the introduction into this country, in 1862, of the roller-mill, which was invented that the wheat-germs containing the enzymes amylase and cellulase might be removed from the flour during milling. A drying plant has been added to the roller-mill. It is used to dry grain after washing while conditioning wheat. If too much heat is developed during drying, the enzymes amylase, cellulase and cerealin are destroyed. When the chemistry of food enzymes is as well unfolded as the chemistry of beer, there will be a great decrease in human suffering, and many prevalent diseases may disappear, particularly those described as deficiency diseases.—*The London Medical Times*.

Some Vital Phases of Fractures of the Jaws *

CHALMERS J. LYONS, D.D.Sc.

THE subject of fractures of the jaws is one that has attracted the attention of medicine since the days of Hippocrates. It also is a subject that was of considerable interest to dentistry long before it became a profession. Indeed, many of the principles laid down by Hippocrates can be used to-day with a moderate degree of success. It was Hippocrates who first originated interdental ligation. It was also Hippocrates who condemned the use of bandages alone as a procedure in the treatment of fractures of the jaws.

In presenting the subject of fractures of the jaws at this time, we shall touch on only two or three vital phases of the subject. The first phase which we shall attempt to discuss will be the process of repair. We use the word "discuss" advisedly, because in our present state of knowledge of the subject, we can only discuss it. We are not in a position to make any dogmatic statements as to just what takes place in the process of repair of bone.

Just what takes place in the behavior of the tissues in the process of repair of bone is a question offering a diversity of opinion. There seems to be an antagonistic state of opinion about the theory of bone growth. There are two schools that are contending for the maintenance of their theories along this line: One contends that the periosteum is a limiting membrane without the property of osteogenesis; the other maintains that the periosteum is an osteogenetic membrane and can go on functioning, developing and nourishing new bone.

Havers, in 1692, gave the first accurate account of osseous structure and described the periosteum as simply a connective tissue, limiting and vascularizing membrane.

Antoine de Heyde, in 1684, made some observations on frogs and determined that callus was formed by calcification of a blood clot extravasated around broken bone ends.

In the middle of the eighteenth century, Duhamel brought out the generally accepted theory of the function of the periosteum. His view was that the periosteum became thickened and succulent around a fracture and by pushing the new tissue in among the fragments it formed a callus. In his experiments, he discovered a layer of cells lying next to the bone. To this layer, he gave the name cambium layer. This layer of cells between the true periosteum and the bone is recognized in the bone work now being done in Europe.

* Read before the Section on Stomatology at the Sixty-Ninth Annual Session of the American Medical Association, Chicago, June, 1918. Reprinted from *Journal A. M. A.* for July 20, 1918.

MacEwen is emphatic in the statements that the function of the periosteum is simply a limiting membrane and does not have the property of osteogenesis. He made many experiments on dogs. In these he seems to prove that the periosteum does not produce new bone. In many instances, he reports that the whole radius was removed, leaving the periosteum. He finds in these cases that after several weeks no new bone is formed. In his experiments, he finds no place where the periosteal flaps produced new bone. He also finds that where the periosteum was not intact, there was a marked hypertrophy of the bone, showing that periosteum limits bone growth.

These experiments of MacEwen are substantiated by similar experiments by Cohen and Mann. Their experiments included transplanting of bone denuded of periosteum into muscle into the medullary canal and into newly made bone defects. Some of these transplants were covered with periosteum and others were not. It was found that isolated bone grafts did not act as foreign bodies and were not absorbed after sixty days, but showed a tendency to outgrowth. They also made experiments in which the periosteum per se was transplanted around the carotid artery. This did not show bone proliferation. They came to the conclusion that the periosteum was not at all essential to the healing of a fracture.

Other investigators in this country have made similar experiments with similar results. These investigations, with others, represent the work of the contenders of the theory that the periosteum is simply a limiting membrane. The other class of investigators in bone work contend that these experiments must have been carried out with simply the outer layer of the periosteum, which is a limiting membrane, and that the inner layer, or the cambium layer, the layer which Hey Groves terms the epiostial layer, or the osteogenetic layer of the periosteum was not considered.

Our experiments at the University of Michigan hospitals do not accord with the theory of MacEwen. We have found that periosteum transplanted into the muscle tissue will produce new bone. This new growth seems to have all the properties of true bone; its blood supply, its bone cells and the process of true osteogenesis seem to be normal.

This deposition of bone differs from other calcific deposits which may take place in the body, such as in the spleen, liver, kidney, etc., under certain pathologic conditions, so that we feel quite positive that under suitable conditions, true bone may form from the periosteum.

Hey Graves summarizes as follows:—

“The periosteum is chiefly a limiting membrane of the bone. The dense bone can live, grow, undergo repair, and produce fresh periosteum after the latter has been removed. In young bones it is possible to remove the periosteum in such a way as to produce an osteogenetic

membrane, this being probably due to the lifting up of the epiosteum with the periosteum. In adult bones this is impossible except after trauma or an inflammation."

In the repair of fractures of the jaws, we feel that the retention of the periosteum is highly desirable, because its removal takes away much of the epiosteum, and, also, because it affords a ready means of vascularization.

While there is a wide diversity of opinion regarding the function of the periosteum in bone repair, all investigators seem to agree as to the function of the compact and cancellous bone in the process of repair.

Ollier proved that quite apart from the periosteum and the marrow, compact bone could live and produce new bone and undergo the callus repair of fracture. The deep surfaces of bone, like the superficial surfaces, are capable of osteogenesis under suitable stimulus.

Axhausen has shown that the wide haversian canals contain active osteoblasts and favorable conditions for new bone formation. It has been observed in gunshot fractures in France that when the ends of the fragments have been exposed and laid bare, by stimulating the ends with a drill, in a short time buttons of granulation tissue would be pushed out and would soon cover the entire ends of the bones. These ends could then be put in apposition, and union of fragments would result. In our clinics, we have had to resort to this method in some old ununited fractures, in which we have had the process of repair again started. It is our opinion that compact bone, if it has the proper blood supply, is quite independent of either endosteum or periosteum for bone growth and for bone repair.

The whole process of repair of bone is fundamentally that which takes place in the union of the soft parts. In fractures of the bone we may have primary union, or, we may have secondary union by granulation tissue; this granulation tissue differs from granulation tissue of the soft parts in that it is osseous in character. The injured tissues, infiltrated with blood, soon become invaded by leukocytes and effused blood plasma. Fibrinous coagulation takes place and the ends of the fragments are embedded in a dense, ill-defined mass of firm, cellular exudate. The periosteum becomes much thicker, softer and more vascular; a thin layer of gelatinous or viscid liquid of the fracture. In about fourteen days, the effused blood is completely absorbed, leaving a firm, dense, cellular, vascularized, partly is found between it and the bone for a short distance from the edge organized mass of granulation tissue. The bone then undergoes rarefying osteitis, and the fracture becomes fixed. This is known as the "provisional callus."

While this process is going on, similar changes are taking place in the cancellous bone, and the "internal callus" is formed in the

same manner. Ossification then takes place, thus completing the process of repair. While the callus is forming, the process of repair is going on in the contiguous soft parts, and they regain their normal condition and function.

Very briefly, the foregoing is what seems to take place in the process of repair of fracture of the jaws. Occasionally there may be an excess of rarefying osteitis, and a lack of production of osteoblasts, so that the callus may not ossify. In these cases, the bone is absorbed for a considerable distance between the ends of the fragments, and we have established a false joint or pseudo-arthritis.

When an open or compound fracture becomes infected, suppuration ensues, and the process of repair is slower, because the suppurative process delays or prevents the formation of the provisional callus, and it has to depend on the formation of the internal callus, which is not so favorable for rapid repair. In these cases, the callus is larger and more irregular than that which we see after simple fractures, when the process of repair takes its normal course.

Another phase of this subject which we shall consider briefly is some of the complications which occur in fracture of the jaws. Fractures of the jaws will differ from fractures in other parts of the body in that they are more liable to infection on account of the close proximity to the bacteria-laden fluids of the oral cavity. We rarely find infection present in simple fractures of the jaws, but it is quite common in compound fractures.

A factor which must be considered in relation to infection in fractures of the jaws is the presence of alveolar abscesses, which may be existing at the time of the fracture or may be superinduced by the injury. These will greatly delay the process of repair and should be eradicated before repair can be expected to take place.

In fracture of the maxilla, the antrum is frequently involved and may become infected. This makes another serious complication. It means clearing up the infection in the antrum before the process of repair will go on in a normal way.

Another rare complication in fracture of the maxilla is the fracture of the brain case, in which coma or even death may result immediately. Secondary hemorrhage is one of the complicating problems that is quite common in fractures of the jaws on the battle fields of Europe. This comes on after suppuration has been established and is the result of infective inflammation causing a disintegration of the hemostatic thrombosis, or ulceration or sloughing of the walls of the vessels. This secondary hemorrhage may occur any time between the beginning of the process of repair and the complete repair of the fractured blood vessels.

The laceration or severing of sensitive nerve trunks will lead to anesthesia of all of the parts peripheral to the fracture, and neuralgia is a common sequela.

Trismus is an early local complication that is nearly always present. This is usually brought on by the violence that is produced on the soft tissues and the temporo-mandibular articulation. In extreme cases, where it is not possible to make the reduction at once, the trismus may be so pronounced that a general anesthetic may have to be resorted to in order to obtain sufficient relaxation to make a diagnosis and subsequent reduction.

In gunshot fractures, there are other local complications, such as extensive laceration of the soft parts, which will greatly add to the difficulty of making a diagnosis and prosecuting the treatment. In these cases, there will usually be greater splintering and fissuring of the bone than in the fractures in civil practice. It is reported that in every case of gunshot fracture of the jaws, infection of the wound ensues immediately, which greatly interferes with the process of repair.

In the work at the front on fracture of the jaws, the history shows that many of these cases are not treated until some time after the injury. Here a new complication arises. In these cases, frequently large masses of cicatricial tissue have formed, and a marked deformity is present. Under these conditions, a clear and definite diagnosis may be difficult, and the successful reduction of the fracture made arduous.

Another local complication, which is almost universal in gunshot fractures of the jaw and sometimes met with in civil practice, is loss of substance of the bone. Here, again, difficulties arise in making a successful reduction and subsequently retaining the fragments in normal relation.

Under the general complications of fractures of the jaws, there are a few factors that must not be overlooked. There are certain diseases which, when present, seem to hinder the process of repair. Such diseases as syphilis, alcoholism, tuberculosis and such chronic diseases as will cause a marked lowering of the vitality of the patient. These conditions will always delay union and may prevent it entirely.

It will not be out of place, perhaps, in this brief paper to say something regarding the prognosis in fractures of the jaw. The prognosis must vary greatly according to the location of the fracture, the character of it, the complications which are present or which follow and the age and resistance of the patient. The time which elapsed between the injury and the reduction of the fracture will also influence the prognosis. The prognosis should take into account several points: First, the effect of injury in respect to a favorable or unfavorable termination of the case; second, its simple or complicated course; third, the influence of each complication; fourth, the time required for recovery; and, fifth, the result as to normal occlusion of the teeth and normal functions of the jaws. The younger the patient, the more favorable the prognosis, because in the young

fractures unite more easily and promptly than in the adult. If the fracture has existed two or three weeks previous to its reduction, and if there is considerable movement of the fragments, consolidation will not take place as rapidly after the parts have been brought into normal relation as it would if reduction were made at the time of injury.

The presence or absence of infection plays a very important role in the duration of the treatment. In a simple fracture of the mandible where the fragments remain or are replaced in perfect contact, repair will take place at once without any untoward symptoms, without deformity or malocclusion, and without detriment to the functions of the jaws. If the fragments are not quite in apposition in simple fracture, but nearly so, the prognosis will be almost as favorable, although it will take somewhat longer for repair to take place and there may be some slight deformity manifested in malocclusion of the teeth.

All compound, comminuted and complicated fractures, which in their very nature present additional obstacles in the way of complete reduction, may not present so favorable a prognosis. In fractures of the superior maxilla, the fragments will not be subjected to muscle strain as those in the lower jaw, and the retention of the fragments in normal position will not be so complicated. Fractures of the condyle with displacement offer less in the way of favorable prognosis than any other fracture of the lower jaw. In these injuries there usually will be produced a traumatism in the temporomandibular joint which may later result in ankylosis.

Gunshot fractures of the jaws, which are necessarily in most cases compound and comminuted, are in a much less degree amenable to treatment than most other fractures. Splints for supporting the fragments must necessarily be more complicated, and infection is always present. All of these factors must be taken into consideration by the operator in forming a judicious prognosis in the treatment of fractures of the jaws.

Time will not permit us to discuss at length the treatment of fractures of the jaws. The treatment of these fractures consists in the fulfilment of three principal indications:

1. Reduce the broken fragments.
2. Retain the parts in normal relation until consolidation has taken place.
3. Prevent or control inflammatory processes.

No hard and fast lines can be drawn relative to the treatment of fractures of the jaws, for each case will present an entirely different problem.

In the treatment, the operator should aim to establish normal forms and normal function. The different forces, such as muscular tension, the force of gravity, movements of the tongue, etc., which tend

to displace the fragments, must be taken into consideration in determining the methods of treatment.

Individual ingenuity must ever play an important role in the treatment of fractures of the jaws. Equally successful results will be obtained by means and methods that are wholly different. In the construction of splints, the aim should be so to design them that all parts of the mouth may be kept clean, without which normal repair will not take place.

Manitoba Dental Association

THE annual meeting of the Manitoba Dental Association was held January the 13th, 1919. There were three vacancies on the Board to be filled, caused by the automatic retirement of three directors. The three new directors elected unanimously are Dr. Greenfield and Dr. Christie (who were retiring directors), and Capt. Stratton, a former member of the Board who has recently returned from overseas. Dr. Manly Bowles, the third retiring director, did not wish to be re-elected, as he had already served on the Board for five years—four as secretary and the last year as president. He received a hearty vote of thanks for his services. The new officers of the board are:

President—E. F. Bush.

Vice-President—Dr. J. H. Greenfield.

Secretary—Dr. C. P. Banning.

Registrar Treasurer—Dr. H. F. Christie.

The other members of the board are Dr. Walter Dazell and Capt. Stratton.

C. P. BANNING, Secretary.

Winnipeg, January 20th, 1919.

Northern Ohio Dental Meeting

“THE Northern Ohio Dental Association meeting will be held in Cleveland, Ohio, Monday, Tuesday and Wednesday, June 2nd, 3rd, and 4th, 1919, at Hotel Statler.”

GEO. B. SMITH, Secretary.



An Open Letter to the Returned Soldier

MY DEAR BOY,—If ever a man has done a noteworthy thing meriting immortality, you are the one. Never in human history have men achieved to greater heights of loyalty, devotion, and self-sacrifice than have the soldiers of the Allies during this war, and somehow whenever the Canadians have been singled out in the reports as having achieved something especially fine, I have found myself swelling with pride and saying to myself: "These are the men of my own flesh and blood." Surely the deeds done by the Canadian soldier are written indelibly on the pages of the past, and no matter how long the records of this war are kept there will always be a permanent place for the achievements of the boys who went from the land of the Maple Leaf and Beaver.

But these are things of yesterday, and in this age of rapid movement we must not dwell too long on what has happened—interesting and thrilling as it all is—but turn our faces resolutely to the days that are before us. And it is just here, my dear Boy, that I want to whisper something in your ear. You are not human if you have not at some time or in some way found yourself figuring on what you were going to get out of this war. In the mud and misery of the trenches, in the appalling awfulness of No-man's land, in the pain-racked wards of the hospital, in all the agony of the entire situation, you have doubtless at times said to yourself that there must be some compensation for all of this sacrifice—a compensation which should extend beyond the days of the war on into the time when you would once more be back on your native heath mingling with your fellow man in civil life. You have probably felt that the Government for which you have so nobly fought should not forget your services the moment they were at an end, and that you were entitled to especial consideration as a returned soldier. Some of you may have gone far enough to say that the Government owed you a living from this on, and that you were "pretty jolly well" going to see that you got it.

Well, all of this is natural, but in the language of the Missouri sergeant, "Let's reason the thing a minute." The first question that arises is, Can you afford to take this position? Granted that the Government agrees with you and acquiesces in your contention; supposing the Government says to you in substance: "You have fought a good fight, you have done your bit, and I will see you through for the rest of your life." Could you afford to accept the Government's bounty, and rest on your laurels? *You could not.*

You have found your manhood strengthened by boldly facing an enemy and doing more than was ever asked of you; and you will just as inevitably find your manhood weakened by holding out your hand and accepting favor from any living man or set of men. Go to the mirror and look yourself straight in the eye and ask yourself if you are the same chap who fought so bravely in those dark days when the odds were terribly against you—fought under all kinds of discouragement, that the principles of liberty and justice might live. See what kind of a look you would have to give yourself if, now that it is all over, you began to capitalize your past bravery and to assume the attitude that society is indebted to you for a living.

I am not minimizing the enormous debt that the world owes to you, I am not overlooking the fact that there are instances in the past where the returned soldier has received scant recognition, and has even been treated with shameful neglect. I am looking at it from *your* point of view—the effect it will have upon *you*. And to you the decision is the most important you have ever made—more important even than the decision you made to go to the front and take your chance in the most savage warfare that ever was fought. That decision determined your career for only three or four years at most, while this one determines your career for the rest of your life. It is the most vital thing connected with your welfare that ever came before you for solution.

No, my dear Boy, do not take a retrograde step after all the splendid things you have done. Do not mar the magnificent record you have made by capitalizing your past achievements and "sulking in your tent." Come out in the open like the brave man you are, and look every fellow in the face without fear, and without asking favor. It may require more courage than you have ever had before to start in on even odds with the slacker who stayed at home and took advantage of the situation in your absence. Never mind, you are better stuff than he is, and "quality counts."

Turn your face toward the light, throw out your chest as you did when on parade, and go manfully to your daily task as if it were just as supreme a privilege to serve in civil life as it is in military life.

Then, my Boy, you will go down in history as not only the greatest soldier in the world but as the greatest man; and when real greatness

is measured it will be found in the ultimate to consist as much in the ability to attain true manhood as it does in the ability to fight.

My best wish for you is that you will always succeed in being a man.—Sincerely your friend,

C. H. Johnson,

Correspondence

28 McTavish Street, Montreal,
12th February, 1919.

Dear Dr. Johnson:

Being one of your many admirers, I have read with pleasure the announcement in "Oral Health" that you are to be a regular contributor.

Your first letter, which appears in the January number, calls for great heart searching on the part of those of us who have given to the great cause of liberty, what is more precious than life itself, namely, our boys and girls in whom all our hopes are centred.

You will not think it presumptuous, I hope, if I venture to take a different point of view from that so ably expressed by you.

If the Germans were a nation of ignorant barbarians every word of your plea for forgiveness and charity would be unanswerable. But unfortunately the excuse of ignorance does not apply in this case. The Germans are one of the most highly educated of the nations of the world, but for fifty years past they have deliberately and systematically absorbed the vicious principles inherent in the doctrines that "Might is Right," and that the moral standards which should govern the life of individuals do not apply to the morals of statecraft.

When educated people deliberately abandon the ethics of Christianity in their political life and sign solemn treaties with mental reservations that they are only "scraps of paper" to be destroyed when it suits their convenience, and deliberately plan to crush their weaker sisters among the nations by every or any means, normal human beings can only regard them with fear and loathing. This it seems to me is the essence of hatred.

When the Germans have shown signs of repentance, in years to come, a younger generation may be able to take a more hopeful view. To those of us who have suffered and are suffering from their diabolical practices of "Frightfulness" upon every section of the communities with which they have been able to come into contact, hatred and loathing are all that are left to us.

Even our Lord did not hesitate to speak of the oppressors of His days as a "generation of Vipers," which to the average mind implies hatred.

One of the most dreadful forms of retribution is the distrust and suspicion engendered when people of intelligence deliberately plan the ruin and torment of their neighbors. This the German nation has been guilty of during four dreadful years, and to most observers there are no signs as yet, that the "leopard has changed his spots."

When, if ever, that happy day shall come the German nation will "take its place in the sun."

I do not think that we are capable, as yet, of separating the deliberate criminal from the results that his crimes have wrought upon our minds and hearts, nor do I think it good for humanity that we should do so.

Believe me,

With kindest regards,

Yours very truly,

F. A. STEVENSON, D.M.D.

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TORONTO, FEBRUARY, 1919

No. 2

EDITORIAL

The Science of Health

A CORRESPONDENT asks whether we consider Dentistry a branch of Medicine. Dentistry is a branch of the Science of Health, as is also Medicine. There is no conflict between these two branches of this department of Science; nothing but the rivalry that may quite properly occur between sisters in the same family. These two branches, along with the other branches of this great Science, will doubtless learn to work more and more in a spirit of harmony and co-operation as time goes by. In the meantime no good purpose can be served by trying to tack Dentistry on to Medicine. It just can't be "tacked."

Possibly our correspondent attaches to the word "Medicine" a much broader significance than it deserves under modern conditions of practice. A century ago the word embraced *all*, but to-day it includes only *a part*, and has come to refer merely to certain well-defined branches of the Science of Health.

In the practice of medicine, so many specialties have developed, that some kind of a reorganization of medical education is demanded by the medical men themselves. Why not a comprehensive plan that would include all branches of the Science of Health? The suggestion of a common two years' course in the pure science subjects, fol-

lowed by a specialized course in the branch desired, is being seriously considered in some Universities, and would be a long step forward. For instance, following the first two years, in addition to a specialized course for the general practitioner, there might be courses in Surgery, Dentistry, Physical Therapy, Eye, Ear, Nose and Throat, Public Health Service, and other important branches. Upon Graduation all would have equal recognition, and each would be trained to co-operate with the other, with a view to the best possible service. We believe some such plan (which is neither new or original) will be in operation within ten years, and will do much to eliminate the present-day monopolistic provincialism that is so frequently manifested, and which so seriously interferes with efficient health service.

Foundation For Dental Research

FOR years the dental profession of Canada has laboured without a systematized method of solving the manifold problems of modern dentistry. Men have struggled, singlehanded, to unravel the mysteries surrounding subjects vital to the dental profession and the human race, and, because of insufficient funds, their earnest efforts have not been wholly successful. During the past few years, however, the wonderful work of Canadian dentists, at home and overseas, has added to the prestige of Canadian dentistry, and, as a result, a new impetus has been given to dental research in Canada. The Dental Research Committee of Canada has been organized to have representatives from each province of the Dominion.

Interest in dental research has been shown not only by the graduates, but also by the under-graduate body. During the recent Victory Loan flotation a few students of the Royal College of Dental Surgeons of Ontario invested in bonds, but the majority, who were unable to purchase a bond, wished to help in floating the great loan. At a mass meeting of the students ideas were exchanged and suggestions advanced. As a result of this meeting the students unanimously decided to raise as a minimum by undergraduate subscription the sum of five hundred dollars, to be invested in Victory Bonds, to be the nucleus of a fund for the advancement of dental research. Members of the faculty of the college by generous subscription and a special grant from the Students' Executive, increased the amount to fifteen hundred dollars, which was duly invested in Victory Bonds.

In response to this evidence of student interest in research work, the Dental Research Committee of Ontario subsequently invited the under-graduate body to elect a representative to be a member of the Research Committee.

The Root of All Evil

THE LOVE OF MONEY has generally been considered "the root of all evil." *But*, in the light of modern science, who will deny that first place must now be surrendered to

An Infected Root?



EDGAR D. COOLIDGE, D.D.S.,
Chicago.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, MARCH, 1919

No. 3

Root Canal Filling and Health*

EDGAR D. COOLIDGE, D.D.S.

THE maintenance of health and comfort of the patient who seeks the services of the dentist must be considered as the most important part of our obligation to the public in the practice of dentistry of to-day. The restoration of lost or diseased dental organs, and the construction of suitable mechanical appliances for mastication, has not lost any of its demands upon our ability or ingenuity, but another responsibility of greater proportions has come to us in the discovery of the intimate relations between the dental organs and the other organs of the body. Teeth that seem perfectly comfortable and useful to the patient may be the centres of infection from which such far-reaching disturbances may arise that the patient may not only be incapacitated for work but may even be brought face to face with death as a result of these teeth remaining in position. One could hardly have lived the past five years without being convinced of this fact by the many articles printed concerning the seriousness of mouth infections, and especially those found at the end of the roots of teeth in the periapical region. Most of these foci of infection start about the apices of imperfectly filled roots. It is a very significant fact that *only a small per cent of root canals filled to the apical foramen show absorption of the periapical tissue*, and only a small per cent. of those canals which are small and fairly well filled show these absorptions. We must keep in mind when examining radiographs of root canal fillings inserted prior to the last year or two that much less care in sterilization of instruments and materials and less accuracy in methods of operating was carried out in the routine of

*Read before the Toronto Dental Society, Monday, 24th Feb., 1919.

the operations for root canal filling at that time than accompanies the same operations of to-day, which would increase the chances of failure in the fillings of the past. Dr. A. D. Black examined a series of 1,500 radiographed canal fillings and classified them as good and poor fillings in large and small canals (Journal of A.M.A., Oct., 1918). The good fillings in large and small canals showed only 10 per cent. of abscesses, while the poor ones showed 65 per cent. of abscesses. It is encouraging to note how few canals with good fillings show present absorptions in the periapical region, and how much larger is the percentage of absorptions about those with poor fillings. *If the canal fillings should all be good ones inserted with strict surgical cleanliness a very large amount of the future trouble would be eliminated, and the danger to general health arising from focal infections in the periapical region of pulpless teeth would be very small.*

The extremist recommends the extraction of all pulpless teeth, and looks with doubt and criticism upon the operator who attempts to cure by treatment, or even removes pulps from teeth for any purpose. The other extremist refuses to recognize any danger from teeth which show no clinical evidence of disturbance or discomfort to the patient. Somewhere between these two widely separated viewpoints lies the opportunity for rendering the best service to mankind. However, when considering these absorptions it should always be kept in mind that mechanical forces in abnormal masticatory stress may cause a movement and loss of density in the alveolar process, and that there may always be an irregular distribution or arrangement of the Haversian canals running through the alveolar bone, which show dark areas upon the radiograph film, and should these happen to fall near the apex of a root would be confusing in the diagnosis. The physician or the dentist or the patient may easily confuse such evidence with areas which are pathologic, and thereby cause the extraction of an innocent tooth. The physician as a rule is ready to co-operate with the dentist when the case concerns both professions, and by this means the best results can be obtained. The treatment of the teeth is the duty of the dentist and the dentist should perfect himself to such an extent that the medical profession will not question his judgment concerning the condition of the teeth, but depend upon him for assistance in consultation where the teeth are involved.

There has been much neglect and indifference to root canal operations in past years, and even to-day there is evidence of a shirking of responsibility in this work. It is better to discover all disturbances and pathologic conditions in the mouth of one's patient who has received one's services for years than to have some other practitioner discover such things. We must face the situation squarely and learn to make a proper diagnosis of these conditions, and extract such teeth as cannot safely be retained, and by proper treatment correct

such conditions as can be corrected, and lastly and most important of all, see to it that *the fillings that we place in root canals to-day, for which we are responsible, are as near perfect as it is humanly possible to make them, and every operation should be carried out with surgical cleanliness.*

The public is awakened to the seriousness of this problem, and is not ready to go toothless, nor be burdened with any unnecessary mechanical substitutes for serviceable teeth which should be saved. The opportunity before us to-day is one of unusual interest and responsibility. If the operator constantly keeps before him the vision of perfection in root canal operations, and carries out in every detail a faithful pursuance of cleanliness and accuracy in each step of the work, the future will reveal a very different condition than we find to-day as a result of root canal operations. This cannot be accomplished at a financial loss to the operator. The service must be rendered to produce the result which the patient expects, and is entitled to, and by proper reconstruction or adjustment of the business methods employed in one's practice the service can be rendered with both satisfaction to the patient and recompense to the dentist.

The subject of root canal operations has become so broad that one paper cannot cover but a small portion of the field, so that it becomes necessary to choose between such phases of the work as the relation of root canals to health; the problem of sterilization; the technic of the operations; pulp removal; the medication of root canals; filling root canals; records and subsequent examination. Each phase of the work is full of interest and so fascinating to the operator that he can thoroughly enjoy every step if a proper attitude is back of the effort put forth to accomplish the result.

EQUIPMENT AND STERILIZATION.

The first consideration should be of the equipment suitable for this work and the care of this equipment that it might be in proper condition for use at all times. Every detail should be efficient but practical, or else its use would become burdensome without sufficient benefit to justify the continuance of it. The sterilizer most suited to the need in this work, which must be done in practically every dental office, is one that is simple in construction but efficient and not beyond the reach of any one in cost. Many years ago Dr. Callahan recommended the Willmot-Castle steam chest and dry air sterilizer for this purpose, and one of that type answers the purpose to-day equally well as at that time. By this means cotton and dressings, root canal points, absorbent points and other materials, may be thoroughly sterilized in every office at a minimum expenditure of time and cost. All metal instruments should be used and sterilized by boiling. One of the most important things in the equipment is a suitable cabinet in which to keep the root canal equipment as a unit away from the

other instruments. A suitable cabinet about 15 inches square can be found with metal removable trays, which are about the proper size to be placed upon the operating table and carry every instrument and all material for the operation so that one may keep the trays in readiness at all times for operating and simply remove a tray when needed and place it upon the operating table complete and ready for use. The tray should contain sterilized cotton, absorbent points, gutta percha points, all graded sizes of broaches from XXX (triple X), fine to the large sizes in smooth and barbed broaches, files and special broaches and root canal pluggers of every size needed. One cannot afford to be without any one of the sizes or styles of broaches, nor any instrument which can make it possible to work more efficiently. Another indispensable article is a suitable container to carry solutions in which to dip the broaches while operating to maintain asepsis. The S. S. White Dental Mfg. Co. have such a tray called the S. S. White Medicament Tray, which serves both the purpose of carrying solutions for sterilization and furnishing ample room for drugs for medication also. With a complete equipment for operating in root canals kept all by itself as a unit, sterilized and ready for use, one has the preparation, and to a certain extent has created within one's self the mental attitude necessary for good results.

PULP REMOVAL.

Assuming that pulp removal is necessary under certain conditions it should be kept in mind that the preservation of the health of the periapical tissue is the all important problem. We have reported to us by many operators that the canals carrying *good root canal fillings show only a very small per cent of absorption in the periapical region*, and some of these areas may have been caused by some form of irritation other than infection. When undertaking pulp removal one must face the responsibility of preserving the health of the tissue about the root end, and when operating should protect it from mechanical injury or injury by septic material forced through the foramen or by drugs.

In removing a vital pulp the safe methods of anesthesia either by infiltration, conductive or pressure direct upon the pulp, should be employed rather than the more dangerous methods by means of caustics, which are more or less unlimited in the extent of their action upon the tissue, and might penetrate through the apical foramen into the tissue beyond. The same thought should be carried out in the use of drugs in any part of the treatment of root canals. The careless use of such drugs as arsenic, phenol, sodium and potassium, formocresol and sulphuric acid have no doubt been the cause of some absorbed areas in the periapical tissue.

The thorough removal of all organic matter from the root canal is essential to the success of root canal filling. This may be accom-

plished by mechanical and chemical means. Aside from the removal of all organic material is the equally important object, namely: to enlarge the canal sufficiently to enable the sealing of the apical foramen with gutta percha, or in other words to gain access to the apical foramen to make it possible to pass instruments close enough to make the filling of the canal as certain as the filling of a cavity in the crown of the tooth with gold foil.

TECHNIC OF OPERATION IN THE TREATMENT AND FILLING OF ROOT CANALS.

1. Placing of root canal operating tray all sterilized and containing all instruments and materials to be used in operation upon pulp.

2. Filling of medicament tray with drugs to be used—phenol, alcohol, tincture of iodine, essential oil, physiologic salt solution, etc.

3. Painting gum about area with tincture of iodine, adjusting rubber dam and washing exposed teeth with tincture of iodine.

4. Gaining access to direct line with opening of canals in pulp chamber.

5. (x) With xxx (triple x) fine pathfinder smooth broach ascertain approximate length of each canal and bend broach to indicate length.

(x) Every time a broach is to be inserted into a canal it is first bathed in phenol and then alcohol in the medicament tray.

6. Remove pulp from canals large enough to accommodate barbed broaches at once. Size of broach xxx (triple x), fine or larger when possible.

7. Pass 30 per cent. sulphuric acid into very small canals with pathfinder broach following approximate measurement from (step No. 5)—neutralize with sodium carbonate solution.

8. Use Kerr file xx (double x) fine, up and down motion, to enlarge canal until smallest barbed broach can enter to remove pulp and debris.

9. Use graded sizes Kerr files consecutively, followed by barbed broaches to remove debris, always using the up and down motion.

10. Continue curettment until No. 1 Kerr root canal plugger will pass within two millimeters of foramen.

11. Insert wires for measure flush with occlusal surface, seal with gutta percha and radiograph.

12. Remove measurement wires, wash canal with physiologic saline solution followed with alcohol.

13. Determine approximate size of foramen with canal pluggers and absorbent points.
14. Cut sterile gutta percha cones into two and three millimeter lengths.
15. Moisten canal with eucalyptol followed with one drop of chlora percha.
16. Select cut piece of gutta percha cone of proper length and diameter determined by measurement in step Nos. 11 and 13; attach to end of plugger No. 1 Kerr by slightly heating plugger.
17. Pass plugger carrying cut cone of gutta percha into canal, following measurement and pack thoroughly.
18. Continue packing piece by piece of gutta percha cone softened by heat until canal is full.
19. Radiograph.
20. Fill in record card and file away.

INFECTED ROOT CANALS.

The problems involved in the treatment of infected root canals are more complicated than of those which are not infected. Sterilization of the tooth in position has been pronounced impossible, however, by the use of antiseptics and mild disinfectants which are not injurious to the periapical tissue accompanied by thorough mechanical curettment of the canal in the process of preparing it for the filling make it possible to obtain a condition that is considered satisfactory, except by the extremist who advocates the "no pulpless teeth" theory. These infected canals where the periapical tissue is healthy can be handled in a very satisfactory way by means of such drugs as tincture of iodine, dichloramine T and Beechwood creosote. Before filling root canals which were infected it is advisable to be sure there remains no evidence of bacteria. The canal should be washed with alcohol followed with sterile water and then a dry absorbent canal point inserted without any drug whatsoever and sealed very carefully. This should remain forty-eight hours and then be removed with extreme care to avoid contamination, placed in a culture tube and incubated. If there is no growth of bacteria the canal may be considered ready to fill.

THE ROOT CANAL FILLING.

The successful filling of root canals depends largely upon the exercise of patience and persistence in preparing the canal properly before the attempt to fill. The canal must be thoroughly filled with a dense material which will not shrink nor absorb moisture nor be soluble in the tissue fluids. It also should not irritate the periapical tissue, for it is a human impossibility to completely fill every root canal without slightly overfilling some. The most desirable filling simply

fills the canal full without excess, and this should be the ideal for us to follow. By careful measurement and accuracy of technic and the absolute control of the material used more uniform results can be obtained than by the use of methods which do not consider the length of the canal, the size of the foramen nor the amount of the material used. The indiscriminate use of thin solutions in filling the canal is unnecessary and undesirable. It only adds uncertainty to the operation and often causes severe pericementitis subsequent to the filling of the canal. Good results are very gratifying to both patient and operator, and the radiograph shows a pretty accurate record of what has been accomplished. If the filling does not appear at the foramen it should be removed and refilled. Gutta percha is opaque to the X-ray, and if present in sufficient density to mechanically fill the canal will show as far as it extends. It is not safe to assume that there is any filling in the canal beyond that shown in the radiograph.

RECORDS.

In closing I wish to make a plea for more complete records of pulp conditions on presentation, and the keeping of more accurate and detailed records of every operation and treatment, including the method used in pulp removal, the drug used at each sitting, the method of sealing the tooth, the material used in filling the canal, and the operator's statement as to whether the filling is good or fair. It is also necessary to follow up many of these operations by subsequent radiographic examination over a period of years to show the condition of the periapical tissue to prove the future outcome of the work we are doing to-day. If this is faithfully carried on by many operators, instead of the expression of opinions regarding these vital problems as we are to-day, it will be possible after a period of years to make statements that are founded upon actual facts.

DISCUSSION OF DR. COOLIDGE'S PAPER.

R. GORDON MCLEAN—I am sure the excellent paper we have just listened to will leave its practical impress on the root canal work of everyone here who is really taking his life work seriously, and who appreciates the fact that when his patient presents one, or more teeth, so diseased that the pulp is, or has been involved, that on his treatment may depend that patient's future health, or perhaps death. What does health mean to such a patient? It means the capability for work, and enjoyment of living, the development of talent and genius, the proper mental attitude towards life and his fellow-beings, in fact everything that is really worth while. Do we, as a profession, show by our change of technique in root canal work that we appreciate the magnitude of the responsibility we have assumed during the last few years?

Let each one personally think this over. What does the health of *your* family, *your* friends, mean to you? You are responsible to others for the health of those just as dear to them. This realization may account for the so-called extremists, such as a club that was formed in an American city called "The One Hundred Per Cent." Club. These men condemn to the forceps all teeth found with partially filled roots, whether the X-ray shows any absorption, or rarefactions, or not, and claim that if they err it is at least on the safe side.

This brings us to another serious aspect of root canal work, and that is the reliability of the radiograph as to the real condition of the periapical region of roots. It is not at all certain that when a radiograph does not show absorption, or rarefaction, that a pathological condition does not exist there. There must be infection before absorption can take place if the absorption is due to the infection. How long that may exist before absorption does take place is not known, but we do know that during that period the X-ray would deceive us. Then again, as the Essayist says, the absorption and rarefaction, as shown at the apices of roots by X-ray, may be the result of mal-occlusion, or of drugs and chemicals used in the treatment and enlargement of root canals. This destruction of tissue would produce a predisposition to future infection, but there may not necessarily be infection at the present. Again, just because the radiograph shows the canals to be apparently filled to the end, it does not follow that the root filling is not porous, or will not be. If the foramen is not at the conical point of the apex of the root the X-ray will often show the root not filled to the end when it really is.

So, gentlemen, we do not know exactly where we are in regard to the diagnosis of pathological conditions in the periapical regions, but we do know that we have to use all of our skill, and take every precaution that we can, to prevent such conditions.

When a dentist is fortunate enough to have his X-ray machine in his operating room it is quite practical to radiograph with the rubber dam in position. This enables you to test the success of your attempt to seal the foramen of the canal before finishing the packing of the rest of the canal. The advantage of this is obvious. Again insert measurement wires, radiograph and remove wires—and this all in a few minutes—with the dam on.

Again, suppose one encounters difficulty in straightening out a curved root in a molar. Insert wire, radiograph, and have it developed while you go on with the enlargement of the other canals. Try this.

The essayist has certainly impressed us with the necessity of surgical cleanliness in all root canal operations. With even a slight knowledge of bacteriology one can easily understand how an hour's skillful work may be rendered useless by a momentary indiscretion. How-

ever, by the use of silver nitrate (Howe method) we may destroy this possibility of infection if we recognize our mistake in time.

There are three cardinal points in successful root canal work when we devitalize the pulp in a tooth: 1st. Asepsis. 2nd. Enlargement of small root canals. 3rd. Sealing of apical foramen.

The technique, as outlined by the essayist, will certainly produce as successful an operation as it is possible to secure, with the knowledge and material we now have.

Personally, I think that with the Callahan method we can fill a root that has more than one foramen, better than with any other method.

Other root canals may be well filled with oxychloride of zinc and gutta-percha points. We must realize that often it is the perfection to which we bring our methods, rather than the method itself, that brings success.

Now as to infected cases, and at present this is the most difficult problem the dental profession has to solve. The plan of hermetically sealing sterile cotton in a root canal moistened with sterile water, and endeavoring to get a culture therefrom, seems to be the only sure way of determining when a root canal is in a safe condition to fill.

Graduates of the last few years have been taught the technique of obtaining cultures in a scientific way, and those who have been practicing a longer time should make it their business to learn it. Unless this part of the work is done with a definite technique and procedure the results are worth absolutely nothing.

In such cases where it is impossible to so test your results, and the history of the patient shows lack of resistance to focal infection, for the protection of the patient extraction would be the kindest and safest procedure. Extraction should also be resorted to if the operator finds it impossible to penetrate to the end of the root canal, where the X-ray, clinical findings, and case history combine to show infection. In the incisors, bi-cuspids, and anterior roots of first molars apicectomy may be resorted to in favorable cases to obviate the necessity for extraction in these cases.

May I emphasize, in finishing, that if the dentist and patient did their full duty, from childhood on, pulp involvement and its necessary dangers would be a condition one would rarely meet with.

Preventative dentistry along this line is just as important as the treatment of the diseased conditions that now exist.

DR. A. D. A. MASON—It has indeed been a great pleasure listening to Dr. Coolidge's paper, and I wish to take this opportunity to congratulate the Essayist on his most instructive and entertaining technique.

One is so in accord with the essence of the paper that adverse criticism seems to be entirely out of place, and one can only enlarge on certain phases of the subject. One question, however, is definitely

answered. "Where are we at?" One cannot reflect on this paper and feel anything but that we know definitely just where we are with reference to this question. We must either fill these canals or remove the teeth. I personally feel that more teeth will join the "One Hundred Per Cent. Efficiency Club" but the remainder will be more efficiently filled than formerly.

The Essayist has made our relation to the patient very plain. Now when a patient enters our office we no longer focus our attention on any particular tooth, but immediately look to the general health of the patient. We ask ourselves, "From what is this person suffering?" and we immediately look to the general symptoms and not the particular local condition in the mouth. We now put the mouth in perfect condition, looking to the patient's general health.

The Essayist quotes as clinical observation that the small canals though not properly filled show a smaller percentage of trouble than the larger ones. This being true, I would like to make this observation. Let us just consider one variety of roots, those which have a heavy layer of cementum over the apical end of root. In these cases we most always have multiple foramen. These foramen are possibly only two or three times the diameter of dentinal tubuli. Now in the removal of the dental pulp if the organic matter is left vital in these foramen, I do not think they will ever become a focus of infection, and even though not filled to the end, will be quite safe from focal trouble.

The facing of our own mistakes with our own patients is the only honest method of procedure. This becomes easy, gentlemen, if we are absolutely honest. We all have caused these foci. Why? Because we did what we thought was right or permissible in the handling of root canals. Now the X-ray has proven differently, but because we were mistaken is no reason for us to perpetuate those mistakes, and we must tell our patients. Better for us to acknowledge our own failures than to have another dentist shrug his shoulders at them.

Disinfection of the field of operation is absolutely essential, and I would like to suggest that we go even farther in cases of pulpitis, and before using pressure anaesthesia one should even disinfect the pulp tissue by sealing in a preparatory treatment. The pulp will absorb the disinfectant just as readily as it absorbs bacteria, thus making absorption of infection less likely.

DR. WEBSTER congratulated the speaker on his sane paper. He cautioned against relying too much on X-rays, and instanced a case where the radiograph showed rarefaction between central and lateral incisor. The pulp of the central was alive, but that of the lateral dead; sinus discharging between centrals. On operating a large area was found about the lateral which on account of condensing osteitis did not appear in the radiograph.

The use of dry cotton to test the sterility of canals was criticized, as the cotton is an effective barrier against bacteria. He emphasized

the very transitory nature of drug action, and urged intensive medication at frequent intervals for a short time. He pointed out that the Coolidge method was suitable only to accessible canals, and advocated the Callahan method of pumping in resin solution in the inaccessible ones. Some thought should be given to the materials used—paraffin, oxychlorid of zinc being valuable in many cases.

DR. C. H. CLARKSON suggested that the bad name given to arsenic and other drugs might be attributed to factors such as lack of asepsis and faulty technic. However, nearly every drug in the dental office must be handled with care and in proper dilution, or irritation is produced with impairment of the peridental membrane. Even the milder drugs, such as cloves, phenol, menthol, thymol, benzoic acid, are quite irritating. Dakins solution also must be used in very weak dilution. The use of pressure anesthesia and infiltration anesthesia often seriously injure the peridental membrane.

There can be no doubt that the over-filling of root canals is harmful and painful, and the Coolidge method of gauging the length and calibre of canals is good. The ideal root filling has not been found, and in difficult and crooked canals resort must be had to pastes such as aristol, iodoform, and bismuth compounded with paraffin, precipitated silver nitrate and very minute quantities of paraform or other "mummifier."

VOTE OF THANKS.

Drs. F. C. Husband and C. H. Clarkson moved and seconded a vote of thanks to Dr. Coolidge, which was sincerely and enthusiastically supported by every member present.

DR. COOLIDGE IN CLOSING THE DISCUSSION.

IN closing I wish to thank the audience for their interest and discussion of this very important subject. The problems encountered in cleaning and filling root canals are many and difficult, but it is no time to lay down. Preventive treatment is the greatest service we can render our patients, but that should not necessitate extracting all pulpless teeth. We may expect much greater care to avoid pulp removal both by the profession and the laity in the future than in the past; however, there will always be many pulpless teeth to treat and some for pulp removal. The prevention of infection from entering the pulp tissue or the periapical tissue is a service of greatest importance, and the dentist who can remove a pulp when necessary and fill it so that the root will remain free from periapical infection and absorption is rendering an invaluable service.

The fee for such service can be obtained to justify all the time and skill required to get the best result. The basis of any fee should be service, and if the service is worth a good fee no sensible patient will

refuse to pay a just recompense. It is largely a matter of what the operator considers the service worth that influences the patient's attitude.

I have never found much satisfaction in the use of ionization in the treatment of root canals, although I have used this treatment for several years in a large number of cases. In the last few months I have found great satisfaction in the use of Dichloramine-T in infected root canals. This is a powder which is dissolved in a chlorinated oil to yield the chlorin slowly when applied to the tissue or sealed in a tooth. It should be frequently changed as it soon loses its strength, but usually the desired result can be obtained with two or three treatments.

In filling canals it is my practice to enlarge all the small canals until they can be filled with the same pluggers as the large canals. In very small or curved canals the pumping method may be used to good advantage, but if the foramen is large there will be quite an excess of filling through the foramen, which is not the best result. I do not claim that gutta percha is the best filling material that we shall ever find for root canals, but it seems to me to be the best up to the present time. Much has been said of Oxy Chloride of Zinc, but I do not think it should be used in filling root canals. In the first place it is almost impossible to get it to the end of root canals, and in the second place if any of it is forced through the end of the canal it is decidedly irritating, much more so than gutta percha. Even if Oxy Chloride of Zinc is used in combination with a gutta percha point it does not seem to me to be as good as chlora percha because of its irritating quality, and the difficulty in both manipulation and in removing if the canal is not well filled.

I wish again to thank those who have entered into the discussion, for it is by discussing the points where there is a difference of opinion that we are able to help each other in this work which is so important to the health of our patients.

Toronto Dental Society

THE last meeting of the Society for this year will be held in the King Edward Hotel on the evening of Monday, March 31st, 1919. The meeting will be of a social rather than professional nature, and will be addressed by J. E. Atkinson, Esq., Editor of The Toronto Daily Star. The results of the election of officers for next year will be announced.

J. E. RHIND, D.D.S.,
President.

W. H. COON, D.D.S.,
Secretary.

War Prosthesis of the Allies

CANADIAN SESSION COMBINED N.D.A. AND C.D.A.
AT CHICAGO, AUGUST 4 TO 9, 1918.

(Continued from February Issue.)

BY MAJOR W. E. CUMMER, CANADIAN ARMY DENTAL CORPS.

LEAVING the subject of fractures, of which Dr. P. Martinier, in his classification (Nolin War Prosthesis, Journal of the National Dental Association) speaks of as Bellum Prosthesis in contradistinction to Antebellum, or that prosthesis done for soldiers in concentration camps, etc., prior to their engagement in actual hostilities, Dr. Villian proceeded to the subject of Post Bellum prosthesis, consisting as the term indicates of that prosthesis of a permanent restorative type done for soldiers immediately prior to discharge. For convenience the writer will quote Dr. Nolin's translation of Dr. Martinier's classification, which is as follows.

Ante-Bellum..... (For concentration and training camps, etc.)	Ordinary consideration modified by	Speed of production
		Simplicity
Bellum..... (During actual operations.)	Reduction Appliances Upper and Lower	Small expense
		Fixation preferred (Hume)
	Retaining, with or without Loss of bone	Monomaxillary
		Intermaxillary, mobile and immobile
Post-Bellum..... Prior to discharge	Internal	Craniomaxillary
		Immediate (first aid)
	Surgically buried in tissue	Remote, using new or same reduction appliance
		Physiological splint (Villian pseudoarthrose)
	Immediate	Overcoming pathological muscular contraction
		Surgical, for holding surgically formed tissue
External	Remote	Cicatrix reducing or stretching
		Overcoming pathological muscular contraction
		Teeth
		Hard and soft palate
		Bucco facial
		Tongue
		Nose
		Eye
		Ear
		Larynx
		Combination of any of above

As an example of internal prosthesis, used in conjunction with surgery, a cranial prosthesis was also shown (Fig. 40), in which, following a wound, resulting in loss of bone in the cranium, a platinum grid was sawn from a sheet of platinum and fastened to the skull. (Fig. 41 and 42.)



Fig. 40. Cranial Prosthesis, sawn from platinum, to be fitted over Hiatus in skull.

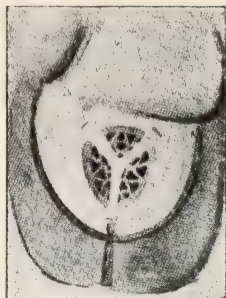


Fig. 41. Cranial Prosthesis showing method of fixation immediately prior to stitching of flap.

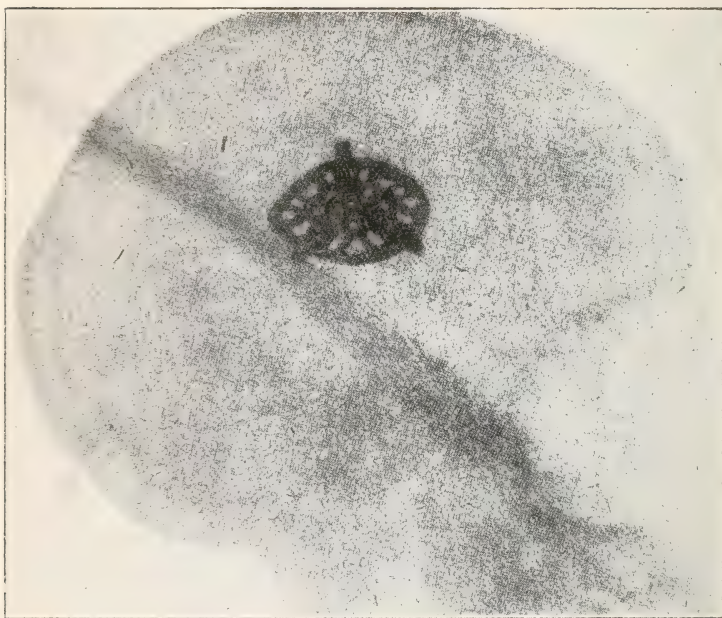


Fig. 42. Cranial Prosthesis in position.

Surgical Prosthesis.

As an example of the marvellous results which may be secured for patients suffering a large loss of tissue, such as the loss of the entire chin, the attention of the reader is directed towards Fig. 49, a result secured by Major Kazanjian in conjunction with Captain Harold Burrows, R.A.M.C., of the Harvard Unit. Fig. 43 shows at first glance the almost hopeless character of the wound. Fig. 44 shows the surgical prosthesis fitted prior to the operation; Fig. 45



Fig. 43. Condition of patient shown in Figure 48 as completed, on arrival at hospital.

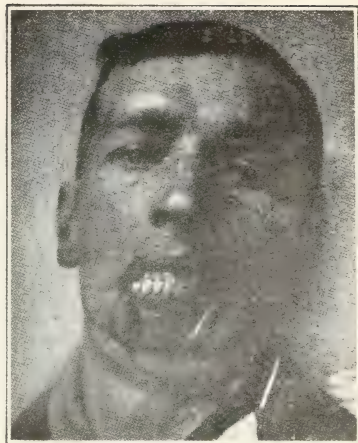


Fig. 44. Patient shown in Figure 43 with temporary Maxillary Prosthesis or Operation Splint in position.

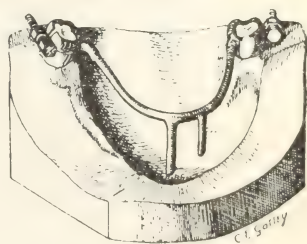
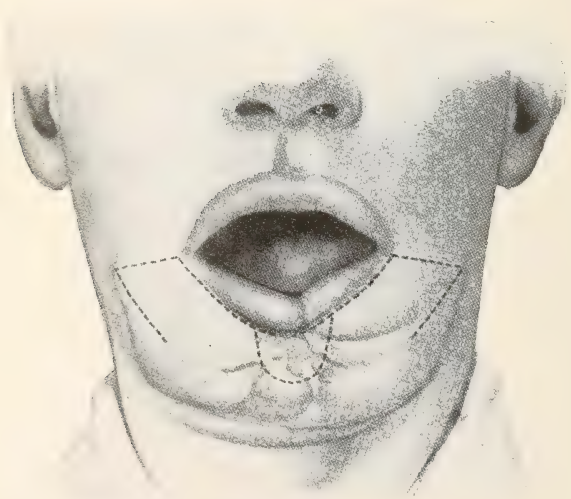
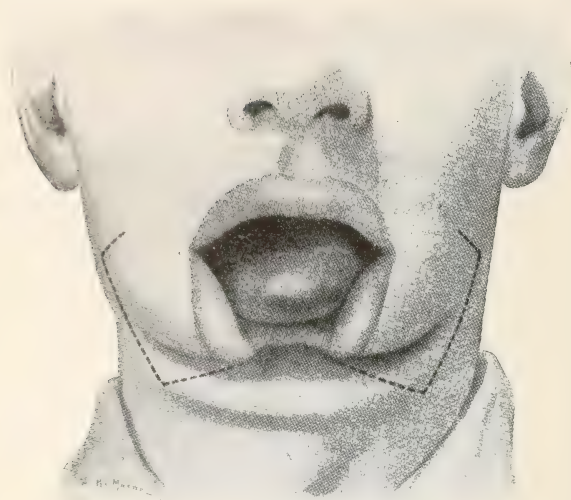


Fig. 45. Details of Operation Splint used in Figure 44.

shows detail of the surgical prosthesis or operation splints, the purpose of these operation splints being to hold the tissue and overcome the inevitable contraction of the cicatrix; Figs. 46 and 47 show first and second plastic operation; Fig. 48 shows the final result in place. In truth one of many results of co-operation of surgeon and dentist, each in his own field, and each anxious to avoid the slightest



Figs. 16 and 17. Details of Surgical Operation called Temporary Prosthesis.



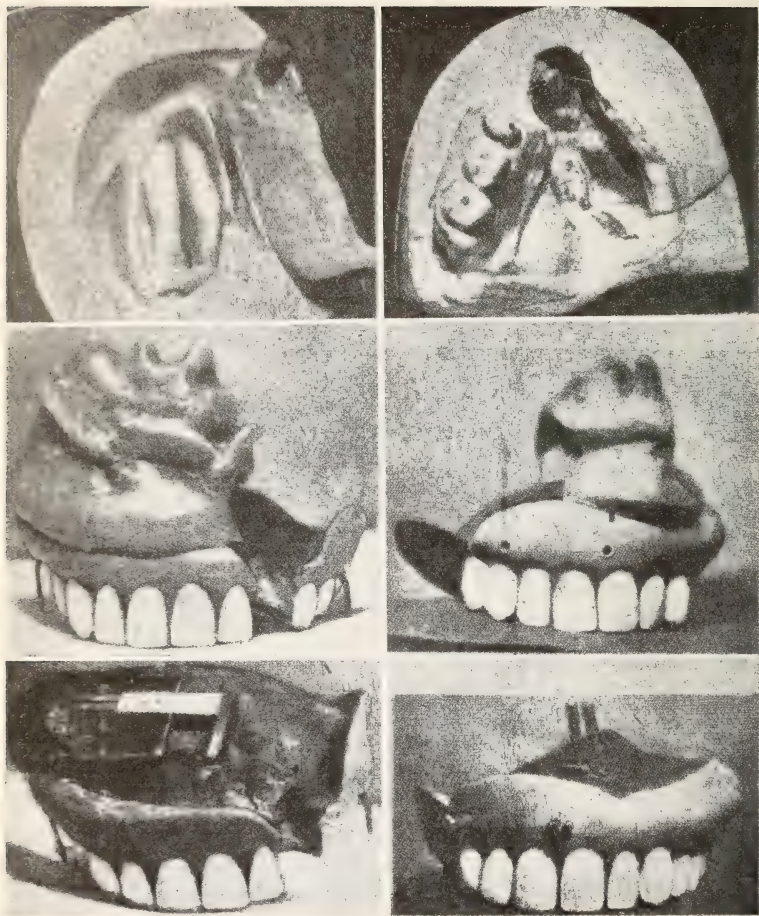
Fig. 48. Completed case, original Figure 13. Kazanjian and Burrows, Harvard Surgical Unit.

infringement upon the field of the other, which make to-day the dentist who loves his profession proud and happy, by the genius of Villian, Kazanjian, Hume, Valadier, Pont and others, to share the honor of dentistry and that of her elder sister, the profession of Surgery.

A surgical prosthesis was also shown which was used following the loss of the Superior Maxilla as shown in Fig. 50 (showing two cases). In one of these the maxillary part is formed of soft rubber, the tissues being sensitive. The method for vulcanization is interesting, inasmuch as the mold in the vulcanizing flask, instead of being filled with rubber, is lined with the unvulcanized rubber, and, with the centre filled with wet pumice stone, is vulcanized, the pumice washed out after, leaving a hollow bulbous soft rubber restoration. The other case, in which the superior maxillae are absent, the denture is locked in place with a sliding latch very similar to a restoration which was shown the writer some years ago by the late Dean Willmott.

Mechano-Therapy of Buccal Tissues.

In this connection a number of ingenious ideas were suggested dealing with superficial and deep tissues. Fig. 51 shows a dilator used in stretching the inevitably contracted scar tissue about the lip, while Fig. 52 shows a surgical prosthesis attached to the teeth and operating upon the tip of the nose. As an example of mechano-therapy for atonic muscles, Figs. 53, 54, 55 furnish excellent examples.



Figs. 49 and 50. Types of Prosthetic Appliances for Maxillary Cases. Upper four drawings show cases with soft rubber Obturators. Lower shows restoration with sliding latch retention.

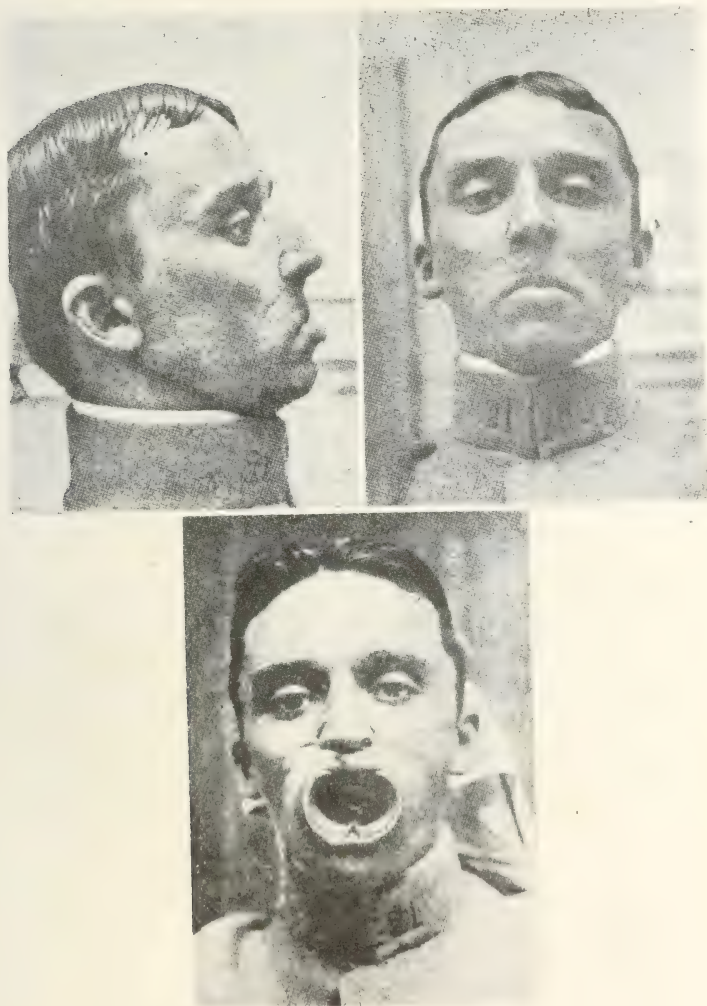


Fig. 51. Showing use of Labial Dilator.



Fig. 52. Showing use of Dilators operating upon a surgically reconstructed tip of nose.

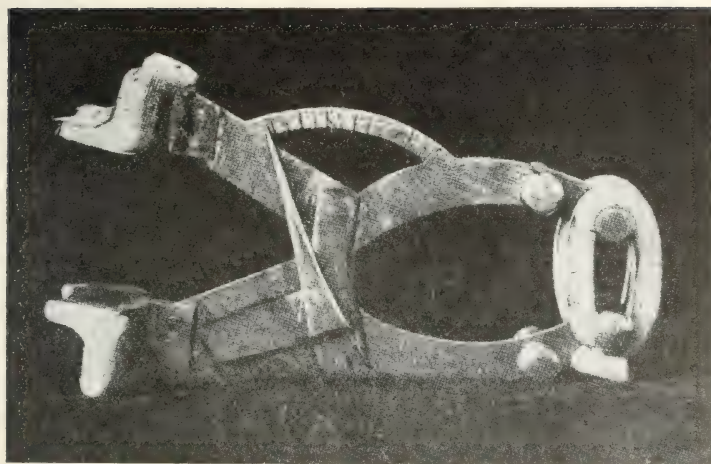
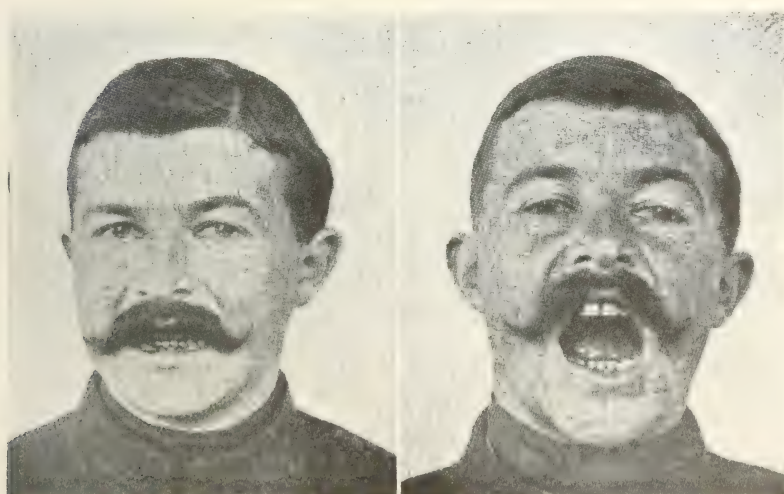


Fig. 53. Appliance for Mechane-therapy. Patient exercises with above appliance between the teeth for overcoming pathological muscular contraction.



Figs. 54 and 55. Before and after use of instrument, Figure 53 showing limit in each case of opening movement.

Permanent Prosthesis, or restorations of a more permanent character. Teeth.

For restorations involving teeth in which the continuity of the bone is undisturbed the problem becomes identical with civilian procedure, except, usually due to abnormal conditions following wounds the difficulty of the problem becomes greatly increased. Relative to these conditions a lack of space in this report prevents an extended consideration of this subject, and it is the hope of the writer to again

treat this subject under a separate heading. For restorations which involve a lack in the continuity of the bone, occasionally support outside the mouth must be secured, to be worn for masticating purposes only. As a striking example of this the reader is referred to a remarkable prosthesis executed by Major Kazanjian of the Harvard Unit, and of the Harvard Dental School, as reported in the Journal of the Allied Dental Societies of March, 1915, to which the reader is referred for further details.

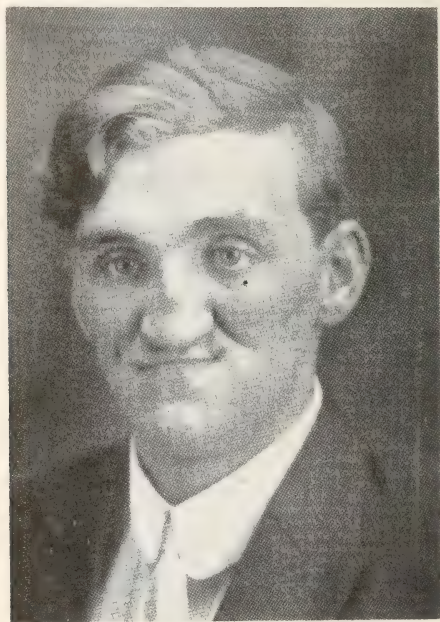


Fig. 56. Showing external appearance of patient in which entire Upper Maxilla has been lost through accident. Col. Kazanjian's case.

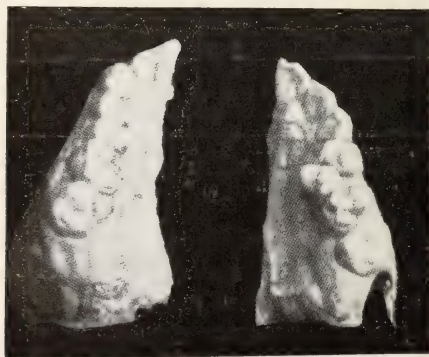


Fig. 57. Showing Sequestra in Maxillary Case, figure 56.

Fig. 56 shows the external appearance of the wound, which was sustained in an accident on board an American battleship. Fig. 57 shows the sequestra bearing teeth, the loss of which resulted in a complete lack of tissue suitable for bearing mastication. (Figs. 58 and 59.)

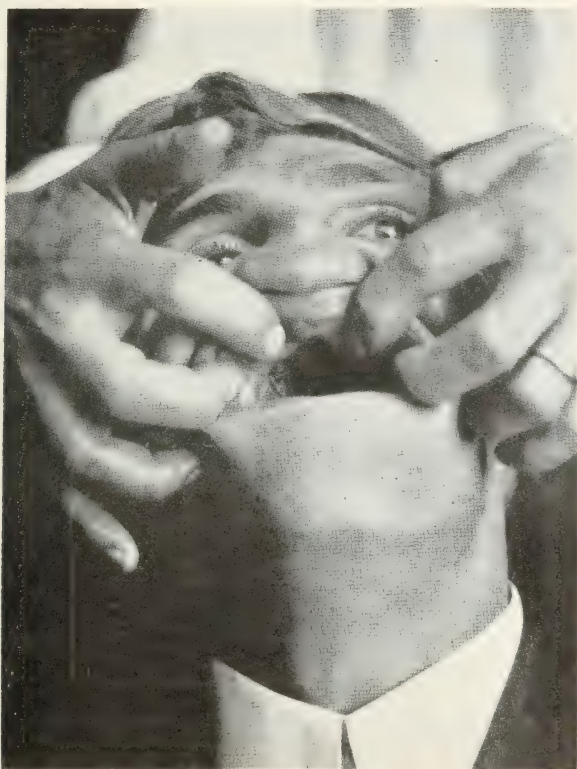


Fig. 58. Oral view, figure 56.

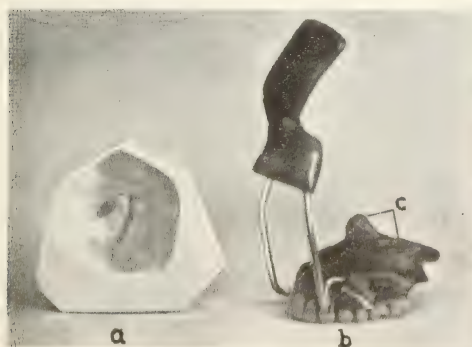


Fig. 59. A Plaster cast of case, figures 56 and 58. B. Appliance designed for this case by Col. Kazanjian.

Fig. 59A shows a cast of the upper maxilla; Fig. 60 and 61 show a special spring attachment developed by this gifted American prosthetist fastened to bridges on both sides of the lower, which serve to hold the upper in place, facilities for adhesion being entirely absent; Fig. 62 shows the restoration in situ, while Fig. 63 shows the frontal

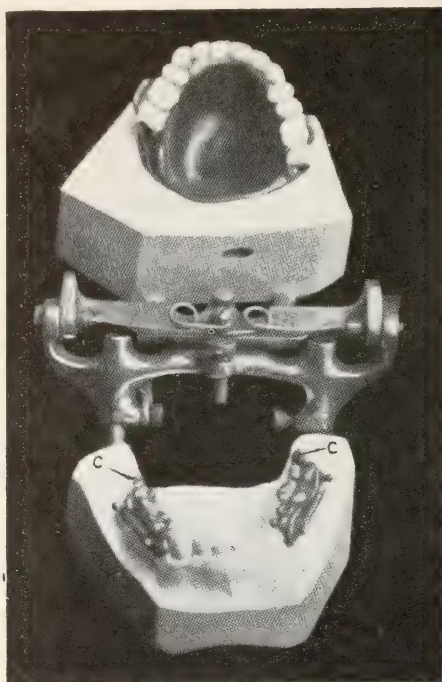


Fig. 60. View of same appliance showing spring retainers attached to lower bridge.

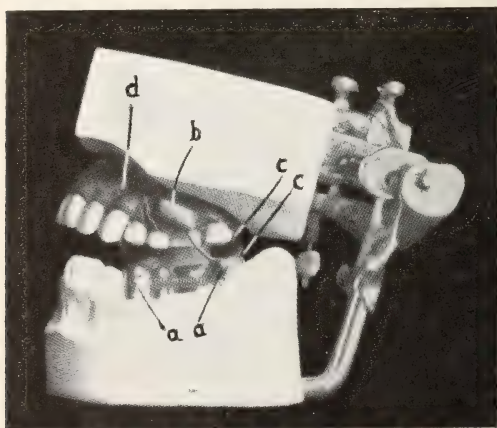


Fig. 61. Lateral view of Figure 60, showing spring lever retention.



Fig. 62. Showing apparatus inserted in mouth.

support, engaging in the orbits, used only for masticating purposes. Fig. 59B shows the appliance in part outside the mouth.

For similar restoration in the lowers assistance can be given the lower denture in cases in which (especially edentulous) a lack of continuity of bony substance exists by hand pressure outside the mouth given by the patient either upon the cheek at the point of loss of bone, or upon a detachable handle fastened to the denture and emerging from the mouth, to be attached and used only during mastication.

Buccofacial Restoration.

At the Congress Dentaire Interallies was presented a case by M. Fourcade, which while not a military case, shows the possibilities which lie in this direction. Fig. 64 shows the result both full face and profile to an unfortunate lady suffering from Lupus. Impressions are made and a restoration is made in a plastic material, from which a mold is developed. Into this mold is introduced a material, gelatinous in nature, which may be tinted to closely imitate flesh



Fig. 63. Same case without Orbital Support (removable and used during mastication only).

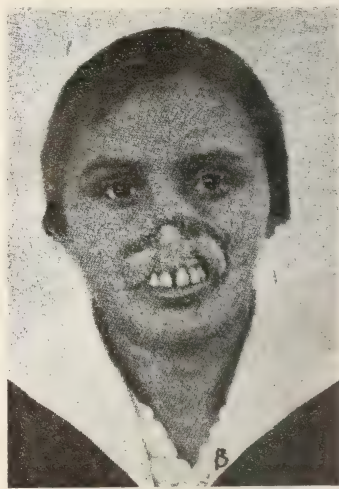


Fig. 64. Profile of front view, loss of tissue through Lupus.

both in color and texture, and from which mold any number of duplicate masks may be obtained. It may be readily apparent that the possibilities for this process, called the Henning process, would

appear very great. The mask is cemented to the tissues with a mastic and alcohol cement. Fig. 65 shows the mask in situ.

Nasal Restoration.

With regard to this type of restoration the writer points with pride to the accomplishment of one of his fellow members of the Canadian Army Dental Corps, Captain H. S. Thomson, in charge of the Dental Clinic, Davisville, and Convalescent Hospital, Toronto, Canada, who in antebellum days was engaged in practice at Moncton, New Brunswick. Fig. 66 shows the patient before enlistment; Fig. 67 the patient after injury, and Fig. 68 the patient with the prosthesis in place cemented in the previous case.



Fig. 65. Same case with Prosthesis cemented in position. Henning process.



Figs. 66, 67, 68. Case of Nasal Prosthesis. Capt. H. S. Thomson, Canadian Army Dental Corps. Fig. 66. Patient before enlistment. Fig. 67. Showing disability. Fig. 68. Patient with Nasal Prosthesis in position.

Following this, the lecturer referred to eye prosthesis in which various wounds, resulting in loss of one or both eyes, with surrounding tissue, either insufficient or incapable of being surgically made sufficient, to hold artificial eyes in the ordinary way between the upper and lower lid and occupy in the orbital cavity in soft tissue. Spectacles are fitted, artificial eyes are ground to fit and inserted in masks upon which the modelling both mass and texture is done, and upon which artificial eyebrows, lashes, etc., are attached. (See Figs. 69, 70, 71.)

Concluding his lecture, Major Villian discussed comparatively results in bone grafting and the artificial stimulation of bone growth by the gradual separation of the bone fragment resulting in a fibrous growth, subsequently calcified, as an example of the apparatus for such gradual separation. (See Fig. 23.)

While the surgeons military are making bone grafts from the cuspid from opposite condyles, yet the lecturer showed a most remarkable series of skiagraphs showing the actual cultivation of bone

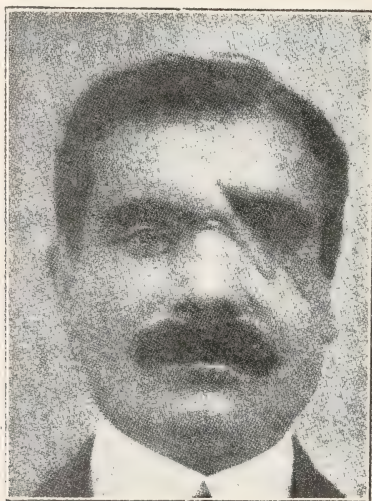


Fig. 69 A. Disability indicating Eye Prosthesis.



Fig. 69 B. Eye Prosthesis constructed.



Fig. 69 C. Patient with Eye Prosthesis in position.



Fig. 70 A. Disability indicating Eye Prosthesis.



Fig. 70 B. Eye Prosthesis constructed.



Fig. 70 C. Patient with Eye Prosthesis in position.



Fig. 71. Eye Prosthesis constructed by writer in connection with the Canadian Army Dental Corps. Note attachment of mask at spectacle temple, ball and socket joint, also at bridge of spectacle ring and stud joint; also special ear terminations for temple; also texture carving and insertion of eyebrow and eyelash in vulcanized mask. On completion this mask was tinted in a most life-like manner by Mr. John S. Gordon, of Hamilton.

by the gradual mechanical separation. In some cases the growth of bone was so pronounced as to call for subsequent excision. This excessive growth is due to too rapid movement. The accomplishment of this most remarkable feat is done while the patients are in many instances engaged in light work at home, visiting the dentist for adjustment of appliances at intervals, similar to the intervals ordinarily employed by orthodontists.

Dean Webster, of the Royal College of Dental Surgeons, Toronto, with his usual wide grasp of the affairs of the dental profession in the North American Continent, has said many times that it would be to our great advantage if a closer intercommunication existed, not only between the Canadian and American profession, but with the profession in other parts of the world. To those present to whom fell the rare privilege of listening to this master Frenchman, and who, with charming courtesy and modesty, concerning his own brilliant achievements, referred oftener than not to the work of his confreres from allied countries, must have been evident this necessity of our profession, as a whole, and it is the sincere hope of the writer that the impressions made upon the American and Canadian dental profession by this representative of the French profession will result in a far closer professional relationship, not only between ourselves, but among the dental professions of all the allied countries. Should this be the result in addition to the incalculable benefits, indirectly bestowed upon the wounded of America, through the Canadian and American dental professions, and the inspiration afforded by Dr. Villian's charming and unselfish personality, and his wonderful genius, the splendid spirit of the French Government in affording us the services of her gifted son at a time when he was greatly needed, will not be in vain.



The Young Lady Office Assistant

I HAVE written several articles on this subject, but I find myself irresistibly coming back to it. When I think of the immense factor which the lady assistant has been in the development of modern dental practice, I am impressed more and more with the fact that sufficient attention is not paid to her in our periodical literature. She is such an integral part of the daily routine of office management, and plays so important a role in making a practice run smoothly, that I am inclined to claim for her the right to have an epic written on her behalf, that her fame may be made immortal. Not that this is to be an attempt at an epic or that it is calculated to make her immortal. Some abler pen than mine must in the years to come do this service for her, and yet I would not feel at this time that I was doing justice to my impulses if I failed to place on record my appreciation of what she has done for the dental profession, and possibly point out in a small way how I believe the rank and file of this splendid body of young women may become even more proficient than they have been in the past.

The entrance of the young lady as an assistant in conducting a dental practice marked an era of increased efficiency and lessened tension so far as the dentist was concerned. This is an age of conservation of time and effort—not so much a conservation of effort, either, as it is a systematization of effort, because in all conscience there never was a period in dentistry when dentists put forth greater effort than they do to-day. But the young lady stepped in as a buffer between the dentist and the myriad petty distractions and annoyances inseparable from conducting a dental practice, and in doing this she left the dentist a freer hand to devote to the real essentials of his work. It is perfectly safe to say that the lady assistant has prolonged the lives of many dentists, and made their efforts more effective while they lived. She has done her work so quietly, so unobtrusively, so unostentatiously that in many instances it has passed without comment, and she has often failed to come fully into her own. And yet

as that last sentence is written I find myself questioning it, or at least qualifying it. No one ever does really meritorious work without coming into their own in connection with it. The world at large may fail to make acclaim over it—there may be no public recognition of it either in spoken or written word, and yet the mere fact of performing a good service, whether it be to discover a new planet, to invent a rotary press, or to render more efficient the work of a dentist, is of itself the supremest satisfaction of all. And many young ladies in the past must have experienced this silent satisfaction in the service they have rendered to dentists.

I have been requested at various times to state what I thought was properly embraced in the duties of the lady assistant, which reminds me that she is not always called "lady assistant." Some call her "dental nurse," and others "secretary," but I hope I may be pardoned for clinging to the older term. The kind of girl that I have in mind is something more than a nurse or a secretary—she is the actual assistant of the dentist, helping him with his work at the chair and even at the bench, and doing any number of things not embraced in the category of a nurse or secretary. She really requires versatility beyond the average individual, and if I were to outline all the things she should be able to do well, I fear it might sound very formidable. And yet to mention a few of the cardinal requisites may not come amiss. First she must have a keen conception of the necessity of conserving the dentist's time. This is a matter of prime importance, and there are numberless ways in which this may be done. Every single thing in the office that can be performed as well by the assistant as by the dentist should be done by the assistant, leaving the dentist more time in which to do those things that can be done by no one except himself—and there are sufficient of these. In addition to this when the two are working together in the operating room or laboratory she should watch with the utmost keenness to keep out of his way so as not to impede his every move for a single instant. She should bear in mind always that his time is more valuable than hers, and she should learn to give way to him at every turn. If he starts to reach to a drawer for an instrument and she is using the drawer for any purpose she should instantly turn the drawer to suit his convenience, waiting to finish her work at the drawer till after he has the desired instrument. If she is scrubbing instruments at the basin—and I trust she does this very thoroughly and painstakingly—and he happens to need the basin to wash his hands preparatory for the next patient, she should instantly step aside and wait to finish the instruments till he is through with the basin.

I know that all this appears rude and ungallant. I know that in the common amenities of life the man should always give way to the woman, but the Moloch of necessity in a dental office, where time

is so important, breaks down the barriers of ordinary usage and sacrifices everything to the one essential of achievement.

And not the slightest disrespect is thereby intended for the assistant, no yielding of that gracious consideration for the welfare of the fair sex on the part of every honest open-hearted man. It is merely that the necessities of the situation demand that nothing, even the convenience of an estimable young lady, be permitted to interfere with the greatest possible measure of accomplishment on the part of the dentist. And the wise girl is the one who fully recognizes this and is always on the alert to see in what various ways she may be able to save the time and energy of her employer by anticipating his every move and having instruments and appliances conveniently at hand the moment he has need of them. She should so study his habits and his methods of operating that she can tell intuitively just what he will likely need next, and she should aim to have it immediately at hand so that the machinery of the office may run smoothly. It is this intuition, this initiative on the part of a young lady, that makes her invaluable to a dentist, and which at the end of the day's work impels him to call her blessed.

I cannot close without just a word as to the obligation which the dentist owes to a faithful assistant. It cannot all be paid by money. In addition to the financial remuneration there should be such an expression of appreciation on his part, such an interest in the general welfare of the dear girl who devotes herself so unselfishly to his service, that she shall know in her heart of hearts that no matter how she may be buffeted by the whims of the public, or even at times by the impatience of her employer, she has in him a true and staunch friend who has her welfare uppermost in his mind even to the extent that he will never see her need for anything so long as he or she shall live. And it is this relationship between the dentist and his assistant which goes farther perhaps than any other one factor in making the daily routine of office practice something less than mere drudgery. It is this constancy of loyalty on the part of each which sweetens the hours of toil, and puts a silver lining in the clouds which sometimes hang over this exacting pursuit.

After all, service is the greatest thing in life, and in all human endeavor there is no greater opportunity for constant and effective service than that presented to the young lady assistant in the office of a dentist. I send my personal greeting to all the splendid girls who are serving in this capacity to-day. I give them the assurance of my goodwill, my profound respect, and my best blessing.

C. H. Johnson,

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

CASTING GOLD INLAYS.

WE all admire a well finished and accurately-fitting inlay. Some operators get results that approach very near to the ideal, whilst others fall far short of this standard. Why is this the case? Obviously the successful inlay worker must have skill in the preparation of cavities, and also know exactly the properties of the metals used in making the cast. A third requisite might be included, viz.: familiarity with the investing and impression materials so that their working properties may be clearly understood and recognized. The degree of heat to which the investment may be subjected without causing deterioration, the amount of contraction or expansion consequent upon setting or heating, the most suitable method for driving out the moisture, these and many other co-related facts must be fully known to the successful inlay worker. For instance, why is it that oftentimes a cast gold inlay is found to be too large for the cavity from which the wax impression was taken? Our knowledge of the properties of gold would lead us to expect an entirely different condition, because we know that gold contracts and does not expand in the cooling process. Then why is the filling too large? We must look elsewhere for an answer to this problem. Perhaps the inlay investment material has expanded as a result of the heat to which it was exposed. If so, we might expect an enlarged casting. So it is obvious that success in this important department of dental operations is closely linked up with a thorough understanding of the deportment of each and every kind of material used in producing the cast. Our aim should be to become familiar with some technique by which the mould will be expanded just sufficiently, so that the gold, contracting as it cools, will assume exactly the size and shape of the original wax pattern. How is this to be accomplished?

In attempting to answer a problem such as this it is best to consult the opinion of those whose success in this particular work is generally recognized. Granted that such a course is "good practice," we shall

refer to the method of inlay making as followed by Dr. R. Ottolengui, an account of which is detailed in the March issue of *The Dental Register*. His method is substantially as follows: After removal of the wax pattern a sprue former is heated sufficiently to allow of insertion in the wax, preferably at one end of the largest diameter of the pattern. The surface of the wax pattern is then thoroughly washed with acetone. It is now ready for investment.

Taggart's investment material is recommended. It is mixed for five minutes, constantly rotating the plaster bowl during the process.

When the material is ready, it is painted over the surface of the wax impression, carefully and slowly, by means of a small brush. A thin part of the investment is used, pushing the brush always in the same direction, thus avoiding the formation of air bubbles. This is continued until the investment thickens just enough to leave a complete coating on the wax. More material is added with the brush until the entire wax model is covered. The ring is then put in place and the balance of the investment material is poured in slowly until the ring is filled. Blotting paper is used to remove any water that may ooze from the bottom of the ring.

Within one hour of investing, the wax pattern should be burned out. This stops all chemical action and prevents distortion of the mould. The burning out process is a very important part of the inlay preparation, for it is here that much of the failure is apt to occur. Place the flask with the sprue hole uppermost, three inches from the top of a three-quarter-inch flame, and allow it to remain for five minutes. Follow this by twice the amount of heat for ten minutes, or all the heat that the flask will stand without causing the wax to boil up through the sprue hole. Any steam formed in this way will alter the shape of the mould. As a last stage, use full flame heat for five minutes, or until a little flame burns at the sprue hole. If small inlay patterns are used then these require ten minutes at full heat. The smaller the inlay the longer the time required for the heat to pass through the investment and reach the space. Dr. Ottolengui classifies the heating stage into three periods: the first which crystallizes the investment, the second which draws the wax into the investment, and the third which burns it out. It is suggested that an alarm clock be used for the purpose of timing the burning out process. Special clocks for timing short intervals such as five, ten or more minutes, are obtainable.

The base and sprue are removed by heating slightly over the flame. This is done with the flask inverted so that no particles of the investment can fall into the mould or pattern cavity. Well refined gold is used for the cast. Dr. Ottolengui emphasizes the need of care in this regard. He would have us never use the remnants of a previous casting for making a new inlay without thoroughly refining the

gold. A fresh nugget of the pure metal ought to be used for each case.

The flask is heated and the gold melted by means of a mixture of gas and nitrous oxide, these being mixed in suitable proportions so as to avoid smoking. The flame should be short, blue and very intense. This will cause the gold to boil without overheating the flask. The cast is made just as soon as the gold is actually boiling.

The finished inlay is cleansed by immersion in hydrofluoric acid.

Dr. Bothwell Resigns From Civic Service



DR. JOHN A. BOTHWELL has resigned from the Toronto Civic Dental Service after having rendered the dental profession and the general public six years of faithful service. Before taking charge of the Municipal Dental Service, Dr. Bothwell was a demonstrator on the staff of the Royal College of Dental Surgeons for a number of years, and a short time ago was re-appointed to the College staff as clinician-in-charge of the Dental clinics at the General Hospital.

While the Municipal Dental Service was originally organized as a school children's clinic, the work was subsequently diverted to the hospitals for the treatment of adults, and the Board of Education organized a separate Dental service comprised of clinics within the school buildings.

Dr. Bothwell was in charge of hospital clinics at the General, Western, St. Michael's, Weston and Hospital for Sick Children, and brought the service to a high state of efficiency.

As Secretary of the Ontario Dental Society, Dr. Bothwell's duties will still keep him in close touch with the dental profession. Regret is expressed on every hand that Dr. Bothwell's private practice compelled him to relinquish a work for which he was so well adapted and of which he made such a great success.

POST-EXTRACTION PAIN.—Post-extraction pain, as well as profuse bleeding, can be helped in a large number of cases, and usually stopped entirely, by prescribing a mouth wash of cold water containing sufficient sodium chlorid to make it quite salty.—*Pacific Dental Gazette*.

Tribute to the Late C. A. Murray

DIED AT MONCTON, NEW BRUNSWICK, FEBRUARY 5TH, 1919,
CHARLES A. MURRAY, IN THE 63RD YEAR OF HIS AGE.

IN the death of Dr. Murray the Maritime Provinces lose one who perhaps has been the most outstanding member of the dental profession in Eastern Canada for the last thirty-three years. Tireless in his energy, Dr. Murray, who graduated from Ann Arbor, Michigan, in 1885, at once began the practice of his profession in Moncton, N.B., and at the same time found time to do all in his power to promote the best interest of the dental profession at large, which he continued to do throughout his entire life. Skilful and conscientious in his work, and by his gentleness and kindness of heart, he endeared himself not only to his patients but to all with whom he came in contact.

Among his brother dentists he was held in the highest esteem, and contributed greatly towards maintaining the high character, dignity and good name of Canadian dentistry.

Although having one of the busiest practices, he always found time to attend any meeting or convention that served to promote the good of dentistry. Always willing to contribute a clinic or read a paper, he in this way contributed largely from his own personal experience and research for the general good.

One of the founders of the New Brunswick Dental Society, he was for many years a member of its executive and chairman of the examining board. He at all times tried to promote an interest in his own profession among the High School graduates and young men in college, and as a result of this there are a score or more of dentists both in United States and Canada to-day who received from Dr. Murray the inspiration and high ideals that have helped them along to professional success. As their preceptor, in college he was always interested in their progress, and during the time spent in his office he not only gave them the best of his experience and advice, but encouraged and inspired them with unstinted praise. His career is known to us all. The sterling character of the man; the uniform worthiness of his aims; his energy and industry in his earnest and persistent endeavours to benefit the dental profession; furnish an example worthy for all. A record of his happy characteristics and real worth is engraved upon the hearts of all who knew him, and deepest in the memories of those who knew him best. And as one who knew him best it is a privilege to pay this small tribute to him to whom I owe largely for advice, inspiration and success in my own professional life.

"Surely he was a genial friend and a kind hearted gentleman."

HARRY S. THOMSON.

Toronto, February 15th, 1919.

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No. 3

EDITORIAL

Need for More Consultations Among Dentists

THE wide-awake, thinking, progressive Dental practitioner of to-day is finding himself, suddenly, in a new atmosphere. The ideas and ideals of yesterday are on the scrap-heap. A new importance, a wider vision, has come to his profession. He can no longer hedge himself within four walls and live unto himself and by himself. That day is gone, never to return.

The practice of dentistry has assumed such proportions, and the variety of cases presenting at the average office are such, that no one practitioner can be expected to successfully undertake alone and unaided the treatment of every case. If the members of the dental profession have been backward and narrow in any particular, it has been in the matter of calling in a fellow-practitioner for consultation over a difficult case about which there may be doubt, or which has not responded to the prescribed course of treatment. But we are at the parting of the ways, and now is the opportune time for our profession to take a saner and broader view of the matter of consultation.

When an important case presents serious difficulties in the matter of diagnosis, or refuses to respond to our course of treatment, we owe it to ourselves and to the best interests of our patient that we state frankly that the case is a troublesome one, is not making the progress that we expected or desired, and that we suggest procuring the advice

of another practitioner in consultation. By so doing the intelligent patient will not accuse you of a lack of knowledge or skill, but on the contrary will rightly conclude that your only ambition is to render the best possible service under the circumstances. Also, by following such a course, you have legally and ethically placed yourself in an unassailable position.

How frequently could it be recorded of the dental practitioner, that after a vain effort to cure by the ordinary course of medication an alveolar abscess at the apex of an important tooth, he concludes he is at the end of his resources and informs the patient that nothing further can be done, and advises extraction? That dentist does a great wrong to his patient. His plain duty would be to call to his assistance a fellow practitioner with some knowledge and experience in oral surgery, and if possible by surgical interference restore to usefulness the diseased organ.

What we are more particularly emphasizing just here, however, is the need for more frequent consultations among the general practitioners in important and stubborn cases. It is true that in the dental profession we are gradually extending our list of specialists, to whom we are more and more referring cases that demand such special knowledge. Yet we must not forget, it is the general practitioner who is the family dentist, and on him falls the burden and responsibility of general mouth conditions, as well as the future health and happiness of his patients. He cannot and he should not depend too much on his own individual judgment. Other men frequently have additional knowledge and could make valuable suggestions. We are learning this lesson to-day as never before. With our post-graduate courses, our society gatherings and our increasing volume of literature, we are mingling socially and professionally to an ever increasing extent. This is to our credit, and to our benefit.

Do not be backward, therefore, in suggesting a consultation: you will be helped, your patient will be helped, and the practice of dentistry will take on new dignity and importance in the eyes of the public.

Dentistry, Medicine and the Science of Health

WE have received many expressions of approval of the editorial in a recent issue regarding the relationship of Medicine and Dentistry, and our statement that each branch is but a department of the Science of Health. It is because each is a branch of the same department of science that both professions must unselfishly co-operate and work in the greatest harmony.

Eighty years ago the Baltimore College of Dental Surgery was organized, following the refusal of the Medical College to recognize and teach Dentistry as a department of Medicine. The result has

been the establishment of dental teaching upon an independent basis, and the organization and administration of Dentistry as a distinct and separate profession. Impartial observers, as they study the history of Dentistry, are led to conclude that the science and practise of this branch has made far greater strides under the circumstances than though Dentistry had been nurtured in the lap of Medicine. A spirit of virility, the will to succeed, and a determination to overcome all difficulties, are valuable assets which the profession of Dentistry possesses in marked degree, largely because of its having been placed under the stern necessity of relying almost entirely upon its own strength and ability. Dentistry was "thrown-in," and either had to sink or swim. She swam. It was the up-stream fight, the cold water and the tremendous difficulties that called forth the last ounce of strength and resource, that have made Dentistry what it is to-day.

It will be well for public bodies in organizing health work to appreciate the present situation. Experiences of Dentists in both civil and military Dental services lead without question to the conclusion that in the interests of efficient and adequate dental service, economical operation and cordial relations, public dental service should be established as a separate unit, as is the profession itself. Should the extent or character of the work require an administrative officer over both departments, this officer should be designated "Health Officer," and not either "Medical Health Officer" or "Dental Health Officer." Such appellations refer to a part of the work, rather than the whole.

It would also be well in the interests of public health for every hospital to establish a distinct dental service. This matter has been under consideration by a number of hospitals in Canada for a long time, but there seems to be a disposition among medical men to carry on hospital work without the organized assistance of Dentists. This is a very grave mistake, and in view of the more recent advances in knowledge concerning focal infection, should be corrected without delay. It is not a question of hospital prerogatives as between this group or that, but rather a question of the health and recovery of the patient. Hospitals maintained by public funds may soon find this question being discussed by the public itself, and quite properly so. However, it would be unfortunate if such an important and vital question were not satisfactorily settled by the hospital authorities, without public pressure being brought to bear.

Ontario Dental Society Meeting

THE Ontario Dental Society will hold its annual meeting in Toronto, Ontario, Monday, Tuesday, Wednesday and Thursday, April 28th, 29th, 30th and May 1st, 1919.

J. E. RHIND,
Toronto,
President.

J. A. BOTHWELL,
604 Spadina Ave., Toronto,
Secretary.

“GOD give us men—A time like this demands
Strong minds, great hearts, true faith and
willing hands,
Men whom the lust of office does not kill,
Men whom the spoils of office cannot buy,
Men who have honor; men who will not lie;
Men who can stand before a demagogue
And damn his treacherous flatteries without winking;
Tall men, sun crowned, who live above the fog
In public duty and private thinking.”



DR. GEORGES VILLIAN
Paris, France

Teacher, Author, and eminent dental authority, and one of the distinguished group of French Military Dental Surgeons, who have developed the treatment of jaw injuries and prosthesis to its present high status; and who has recently appeared before gatherings in all the important dental educational centres in United States and Canada, acting under instructions of the French Government. To those familiar with the dental literature of France, Dr. Villian's name stands among those of the first rank; and those to whom has fallen the rare privilege of personal contact with this distinguished son of France, will long carry delightful recollections of amazing versatility, learning and fingercraft, coupled with a rare personal charm and a wholly unselfish devotion of his great talents to the service of his fellows.

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Food Deficiencies as a Factor Influencing the Calcification and Fixation of the Teeth

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I MUST, in the first place, apologize to the Odontological section of this Society and to the distinguished visitors who have honored us with their presence this evening for having taken upon myself the task of introducing this subject. I can claim no special knowledge of these food deficiency products or so-called "vitamines." In fact I have only a very superficial and inadequate acquaintance with the various and varying theories that have been held on this subject.

The problem of food deficiency factors, or so-called "vitamines," has of late years received an increasing consideration, and there have been brought together from most different sources an abundance of facts which seem calculated to enrich our conception of the dietetic value of foods.

The investigations have revealed that satisfactory growth of nutrition cannot be maintained upon a diet containing protein, fat, carbohydrate, salts and water, but that in addition certain other essential constituents are necessary, of which as yet very little is known. These are known as accessory food factors or "Vitamines," and are present in a very small amount in most natural foods, and their chemical nature is unknown, but healthy life is impossible in their absence.

The diseases that are known to be produced by the lack of these accessory factors are beri-beri and scurvy; others which are believed to be caused by the lack of accessory factors, but of which the proof is incomplete, are rickets, sprue and pellagra.

Before proceeding with the experimental part of the work done I would like to give a short review of the work on scurvy and rickets,

and a few of the many theories that have been advanced as to the cause of the rapid increase of tooth decay.

The etiology of beri-beri is well understood to-day, but as this disease is not endemic in this country and rarely occurs in infants, and as far as I know it causes no dental disease, it is therefore not to our interest to discuss it here to-night.

Thrush or "sprue" is interesting to medical men, but as yet I know of no scientific work done on this disease.

Scurvy is not a new disease, as some people are led to believe. A description of scurvy is to be found in the narrative of the campaign of the Christian Army in Egypt under Louis IX. about the year 1260. The historian of that crusade was not only eye witness of the disease in others, but was himself attacked with it. He speaks of the debility and tendency to swoon, black spots on the legs, bleeding from the nose, and the livid and spongy condition of the gums, etc. The barbers used to go around trimming the gums of the sufferers.

Scurvy has unquestionably existed in the north of Europe from the most remote antiquity. That we have no mention of it in the early history of the Northern nations must be imputed to the ignorance of the people, especially as regards medicine.

Well-marked, so-called florid, scurvy among infants was not an uncommon occurrence about the period 1875-1900, when artificial feeding was popular and patent foods were enthusiastically adopted. At the present day it is probable that mild incipient scurvy is more common than is usually believed. This condition is solely due to the rapid increase of artificial feeding of infants.

Obscured though the exact etiology of infantile scurvy may be, it is probable from clinical facts that this affection arises from causes distinct from those that produce rickets.

Almost all that is known of the pathology of scurvy amongst infants is due to the investigations of Sir Thomas Barlow and Professor Still, of the Great Ormond Street Children's Hospital, London.

In adult scurvy we have conclusive proof that the prolonged deprivation of fresh vegetables, or their equivalent, is certain to bring about a scorbutic condition. We are also sufficiently familiar with the fact that proprietary infant foods do not contain the accessory factors that are necessary to prevent scurvy. It has been demonstrated experimentally that these accessory factors which prevent scurvy are contained in human milk and in the milk of the cow, but not in large quantities, but they are destroyed by the process of heating to a degree depending on the time and temperature of heating. It is clear, then, and fair to say that the further we get from a natural food which is consumed in the raw condition, like the mother's milk, the more frequent will be the risk of the disease. Dried milk contains less of the anti-scorbutic factor than raw milk.

The age at which we should be on the *qui vive* for the initial symp-

toms of scurvy is about the eighth month of infantile life. It is exceptional when the symptoms appear earlier. This point is of considerable importance in diagnosing.

Professor Still in his clinical picture of the fully-developed disease is striking enough; an infant who has been fed upon one of the patent foods, with or without milk, or on milk which has been condensed, sterilized, or otherwise altered, has been ailing for some weeks, has taken food badly and probably lost weight. Moreover, the mother says it cries whenever it is touched, and, as she puts it, "has lost the use of its limbs." The infant is pale, it lies quiet perhaps until it is approached, when it cries out in obvious dread of being touched; the legs lie motionless, usually with the thighs slightly abducted and averted, and the knee slightly flexed; the arms are less often affected.

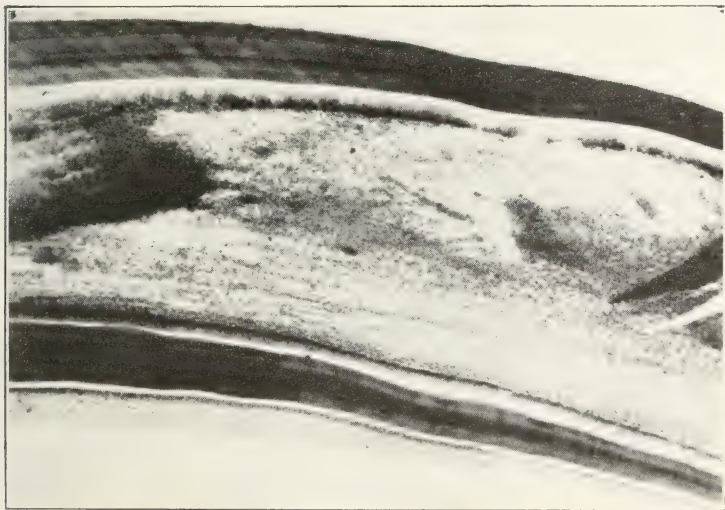


Fig. 1. Normal Guinea Pig Tooth 40 X.

There may be some swelling of part of one or other of the limbs, obliterating the natural curves. Any handling of the affected limbs causes a piteous cry, evidently of acute pain. If teeth are present the gums around them are swollen and purple, occasionally projecting like a mass of granulations almost completely hiding the teeth, and bleeding readily when touched. The urine is perhaps smoky, if not red with blood. Such in outline is the characteristic picture of infantile scurvy.

Rickets is believed to be a disorder of nutrition, and as such affects the whole system. The bone changes are only part of a general disease. The child may suffer severely and yet show so slight

To Dr. P. P. Laidlaw, of Guy's Hospital, I wish to express my gratitude for much useful advice and help in the histological work, and to Mr. F. Martin Duncan for the pains and skill taken with the photomicrographs.

a degree of rachitic change in the bones that the disease might almost pass unnoticed, if only the osseous system was considered.

The temperature is normal, even during the most active stage of the disease. A rise in temperature is almost always due to some complication. There is little to be said in favor of an infective origin. Rickets amongst children in the British Isles has grown to a very alarming state. From 50 per cent. to 80 per cent. in London clinics show signs of rickets to a more or less marked degree. It is found in the Dominion to a less extent, but is quite common.

Symptoms.—Delayed dentition is one of the most constant symptoms. It has been found in 32 out of 42 consecutive cases between nine months and three years old that this was present. Frequently no teeth have appeared at the end of the first year. Rarely their appearance is delayed beyond the period of eighteen months. If dentition has begun before the onset of rickets it is often arrested for several months. There is a striking tendency to very early caries, even before the tooth is fully out, the enamel at the cutting edge is often completely destroyed. Amongst other symptoms is sweating of the head during sleep, large protuberant abdomen, reluctance or inability to stand, which makes the child late in learning to walk, the softness of the bones and ligaments, which makes the bones bend and the joints to yield, with resulting bandy-leg, knock-knee, or other deformity; stooping curve of the spine, large size of the head and square shaped, with all the tendency of convulsive disorders and to catarrh of the respiratory and alimentary tract, adenoids, chest affections, indigestion, etc.

The most prominent symptoms, no doubt, are those that affect the bones, but in rickets there is a general disturbance of metabolism, and its effects are not limited to any one tissue of the organism. Until a cure is made the disease prevents satisfactory nutrition of the bones and teeth, stunts and deforms the bones of the face and jaws, etc., and the damaging results are carried by the patient through the whole of his life, even after a cure is effected.

This great affliction, which appears to become more common every day, if not altogether prevented, can easily be remedied, if the baby gets lots of fresh air and a proper diet, which is the mother's milk and which every baby needs. If the conditions are such that the baby is prevented from getting its proper diet and has to be artificially fed, too much care cannot be exercised in watching its progress for the first eighteen months, especially in regard to the weight of the infant.

The early stages of scurvy and rickets are almost impossible to diagnose, and a baby that has to be fed on an artificial diet should never be allowed the use of a teat or "dummy," as the diseased condition of the bones, caused by the absence of the food deficiency products, with constant suction of a "dummy," will rapidly cause badly developed jaws and nose, followed by adenoids, nasal obstruction,

irregular articulation of the teeth, mouth breathing, and the whole train of evils which this condition gives rise to.

It is important that a baby's weight should be kept normal. Rickety babies usually appear to be fat. If the disease is to be checked before serious harm is done to the child, the early signs must be recognized as soon as possible.

The first symptoms point to *pain from teething*. (Painful teething in children is just as much a disease as any other baby ailment.)

The second symptom is *late dentition*. (Every baby should have at least two teeth between the sixth and seventh month.) If the child shows these signs, rickets should be suspected.

It is amazing that these evils are known to exist, and it has been



Fig. 2. Same as illustration No. 1 but 200 X.

pointed out that they were due solely to improper diet, and yet medical men will allow mothers, who are quite capable of suckling their infants, to feed them on artificial foods and so deprive the infant of its heritage. Perhaps the fault lies in not having direct scientific evidence to show that a faulty diet was the direct cause of improper fixation and calcification of the hard tissue.

Now we will take up some of the most important theories that have been advanced during the past fifty years as to what is the cause of the rapid increase of tooth decay. Miller's *Chemico-Parasitic Theory*, which accounts for the phenomena of caries of the teeth, does not explain the rapid progress made in the increase of dental caries accompanying civilization in the past hundred years. In view of the fact that the incidence of dental caries has been greatly on the

increase, especially in the past fifty years, it would seem obvious that our present mode of treatment of dental caries was radically wrong, that the judgment of time and experience alike condemned it, and that such measures as are now in vogue have proved futile to arrest the progress of what has become the most prevalent disease of civilized communities.

Heredity.—Professor Darwin, in his address to the British Association in 1909, set forth some of the difficulties which exist in accepting either the theory of pangenesis or that of the continuity of the germ-plasma as an explanation of heredity. I have no intention, for I have not the necessary knowledge, to express an opinion on heredity. The only information that is at our disposal in regard to this theory are statistics of family history, which appear to throw very little light on the subject.

Chemical analysis of our teeth has yielded us so far little or no information, and biochemistry is as yet still in its infancy.

To what extent do “vitamines” affect the enamel? We do not, at present, know how far differences in their action may modify the rest of the tooth, but the connection which appears to exist between the enamel and the odontoblastic cells is direct; if this is not so, I should call it an “inborn error of metabolism.” I know I am going to be severely criticized by my friend Dr. Mummery, and very generally by all of the leading dental anatomists, who state, as I understand it, that when the enamel is once formed it is formed for good, but strong reasons have adduced me that this belief is not based on such sure grounds as is generally supposed.

I made a trip to Scotland last month with a view to studying the diet conditions in the Highlands and Lowlands. I have always been led to believe that the Highland Scotch had better bones than are to be found in any part of the British Isles, and I thoroughly believe they have. This is largely accounted for by their simple diet of natural foods. Up to a few years ago the Highlanders’ meals were very simple. Their breakfast consisted of brose at 6 a.m. Brose is made by pouring boiling water over oatmeal, stirring all the time, and adding a little salt. It was eaten with milk, syrup or treacle, and some had butter with it. The next meal was between 11 and 12 o’clock, which consisted of potatoes and salt herring. No bread was eaten, but for the second course a bowl of milk and a piece of oat-cake was taken. This was a universal dinner all through the North. The next meal was about 6 p.m. Again brose, but as a variation it was made with boiling milk, instead of boiling water. Between the mid-day meal and supper they had a glass of milk, and in later years tea came in. The only variation from this diet was on Sundays. Breakfast was usually later and dinner was served after church, which consisted of boiled cabbage and turnips. For supper on Sunday they had boiled potatoes and fresh fish, and sometimes pork, but

the pork was very sparingly used, as one pig had to last a family for the whole of the winter. Beef was rarely eaten.

Rickets is not known by Dr. Bremner, of the Department of Public Health for the County of Sutherland. He told me there had not been a case in his district. He also stated that the percentage of artificial feeding of infants was practically nil. A mother looked upon it as a disgrace if she was unable to feed her child, and it is only recently there has been a small percentage in the coast towns where the women are compelled to hawk their fish and render other duties which make it impossible for them to breast-feed their children, but away from the coast there is practically no artificial feeding.



Fig. 3. Scorbutic condition of Guinea Pig Tooth as shown 15 days on Scorbutic Diet 40 X.

A remarkable thing among the old type of fishermen to-day is that there is hardly any decay in the teeth of men of 70 to 80 years of age, but the young generation has quite a considerable number of decayed teeth.

The following is a little incident which I would like to relate. I happened to call on a very intelligent old lady, 81 years of age, and after a short conversation with her relating to the subject of my trip, she immediately told me that the curse of the Highland Scotch to-day was tea. All the crofters or poor farmers keep the teapot going from morning until night, and are sipping tea all day long. I remarked that she had a very good set of teeth, and she told me, in her broad Scotch, that she had lost one tooth through an accident, and that she

had never had a tooth brush in the house. I might state here that a tooth brush was hardly ever known among the last generation of the Highland Scotch. However, I will refer to the tooth brush and its uses later on.

Dr. Bremner, of the Department of Public Health for Sutherland, gave me a lot of valuable information in regard to his examination of the men for the Army and Navy from his district. He found that all the men over 20 years of age and up to 45 had exceptionally good teeth; as they advanced in years their teeth showed wear but no decay; but there was a vast difference in the teeth of the men under 20 years of age. I asked him what he thought it was due to, and he said he thought it was to nothing else except to the rapid change in the diet. He stated also that there is an increase in tuberculosis, due to the same cause. The crofters or poor farmers are taking to artificial foods and discarding the natural foods. The oatmeal and potatoes are being exchanged with the grocers for white bread, jam, syrup and tea. These are all less valuable foods as regards content of accessory factors. I was told by one public health officer in the Highlands of Scotland that there are a great many families at the present time that make two meals a day off bread and jam or treacle, and their mid-day meal consists of potatoes and fish, and this class have become inveterate tea drinkers.

What a different condition presents itself in the Lowlands. I found in the Clyde district a different type of Scotchman altogether. The great reason for this is, to my mind, the diet of more refined foods. The people are better housed and sanitary conditions are better than in the North. Rickets and scurvy in the infant are as bad in this district as in any part of the British Isles, and they have left their mark on the older generation. Nearly every person is wearing false teeth, or presents a row of decayed teeth when they open their mouths.

THE USE OF THE TOOTH BRUSH AND ANTISEPTICS IN THE MOUTH

Has oral prophylaxis been a success as a preventative against tooth decay? Our great army of dentists and teachers all over the civilized world are recommending the diligent use of the tooth brush. One dentist that I know conceived the idea that he could prevent his patients' teeth from decaying altogether by oral prophylactic measures. His method was to have his patients come to his office as often as he thought desirable, once a week or once in two weeks, etc., and thoroughly cleanse all the interproximal spaces. This kind of a practice did not last long, as the cavities were multiplying so rapidly that he had to either send his patients to another dentist or return to his general practice. He decided on taking no chance of losing his patients, so went back to general practice.

No, I do not believe the tooth brush ever prevents tooth decay. If

the enamel will not resist the action of the fluids of the mouth, the tooth brush will not prevent the onset of decay on the surface of the teeth or in the interproximal spaces. It has been found that mouths that are immune to decay have very often a greater number of fermentative bacteria than the mouths of patients where decay is rampant. The plain fact is that the tooth brush is a dangerous germ-ridden instrument, which it is practically impossible to sterilise. It cannot be boiled, and we have no disinfectant which would render it aseptic and not leave it unfit for further use.

On my way back from Jena to Canada, in 1904, I called on my old friend Mr. Gilmour, in Liverpool, and was telling him about some experiments that I had made during the summer with different tooth

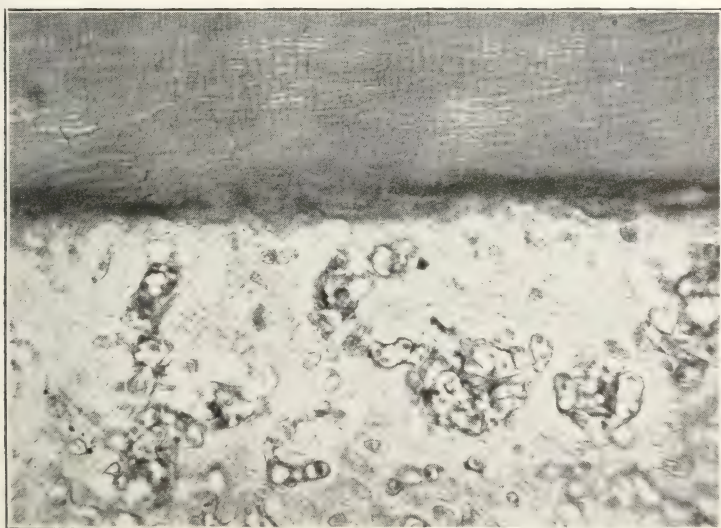


Fig. 4. Same as Fig. 3 but 200 X.

pastes and washes that are in general use. I showed him my results, and told him how short a period the antiseptic properties of these washes would last, and the increased growth of bacteria over the normal within a few hours' time, due to the destructive effect on the delicate mucous membrane of the mouth, causing an impaired condition of the natural resistance and thereby intensifying the growth of bacteria. In no case did the antiseptic action last over fifteen minutes. He then told me that he had been watching the results of different patients of his, that he could rely on as being very careful to cleanse the mouth out regularly, and that frequently they had an increased amount of work to be done over the previous year. On turning up his records, I found some of his patients he was referring to were using the same pastes and washes that I had experimented with.

For our own comfort we have got to keep the tooth brush going, but it is not going to prevent tooth decay. Tartar has never decayed teeth, but in lots of cases it has, I believe, saved them from decay. If you gather records of conditions of the teeth extending over a large area, you will find the least decay always where the tooth brush is not in use, and this has been my experience all over.

We have, therefore, to look to some other source to find the true cause of tooth decay, and I think it can usually be traced to the improper diet of the child in infancy.

Antiseptic Washes.—The conception which prevails generally among medical and dental practitioners in regard to the use of antiseptic washes in the throat and mouth is singularly confusing and confused. It is credited by them with consistent and often contradictory attributes, so great is the lack of clearness and precision of scientific work on this subject, when it approaches this topic, which has so weighty a bearing on our daily work. I began to despair of ever being able to get an antiseptic wash that we would be able to use on such a delicate structure as the mucous membrane of the mouth and throat, but through the work on flavine of Dr. Browning of the Bland-Sutton Institute, we have now a wash that will not only act as a good antiseptic, without causing irritation, but its retentive powers are such that it keeps the bacterial flora down for hours instead of a few minutes.

EXPERIMENTAL.

This report is based on histological work carried out on the teeth and jaws obtained from considerably over 100 animals.

Method of Investigation.—For the purpose of this enquiry the lower incisor and molar teeth of the guinea pig were chosen. As in all rodents, these teeth grow from persistent pulp, and are never shed. The teeth while still in situ in the lower jaw were decalcified and sections made in an antero-posterior direction, parallel to the long axis. In advanced cases of scurvy the teeth were apparently sound, but useless, inasmuch as they had been loosened by the gradual absorption of the cement membrane of the alveolar sockets, which had left exposed that portion below the neck. As a result there must have occurred that peculiar periostitic pain or something analogous which follows in the case of human patients who are suffering from shrunken alveoli. These teeth also presented, in addition, all the appearance of the changes of senility. A great number of longitudinal and transverse sections suitable for microscopic examination were obtained. The revelations offered by these sections are of a particularly interesting nature. Note the fine line of the dentine and odontoblastic cells as compared with figures 3 and 4.

Figures Nos. 1 and 2 are of a normal tooth, and give one the opportunity of studying the histology and patho-histology of the dental

pulp in its normal relationship to dentine. The enamel is not quite as heavy as in the natural tooth on account of the decalcifying process, which has reduced it to about half its thickness, but it gives one an excellent example of the typical appearance of the relationship to the dentine of the blood vessels, the fine cellular tissue and odontoblastic cells when in a normal condition.

Figures Nos. 3 and 4. It is obvious that the term "Fibrosis," or fibroid degeneration, is the only one which can with certainty be applied to this particular form under notice. There is no doubt that it is a specimen of degeneration, and it is equally easy to eliminate those other degenerative varieties, such as mucous, calcareous or fatty, which animal tissues may undergo.

The present instance affords an opportunity of examining certain structural metamorphoses in the pulp, which are believed not to be dependent on any inflammatory condition, but simply attendant on, and produced by, altered metabolism or constitutional changes due to the diets.

Minute descriptions have been published on pulp nodules, calcareous pulps and elaborate work on ulcers and tumors connected therewith, but this affection seems to have been unknown or overlooked by the pathologists both in Europe and America. In no case does one find the condition as depicted in figure 2 brought about by a dietetic experiment. It is evident in this picture that in complete pulpar fibrosis no cellular elements of any description occurred. It is clear at once, and it is an important fact, that no trace of cellular organization, no trace of cell nucleus, no trace of interstitial cement substances, can be found anywhere. Nerves, cells, blood vessels and odontoblasts have all shared the process of fibri-fication and are no longer recognisable. The fine cellular connective tissue, which is but a loose mass of network in the normal state, has either become grossly hypertrophised or quite obliterated, and its place taken by a new firm, fibrous structure, devoid of cells, nuclei, or any regular arrangement of constituted parts.

Figures Nos. 3 and 4 show an advanced state of scurvy. The irregular osteroid condition of the dentine is well marked, and the different refractive appearance of the dentine is probably due to the haemorrhagic condition of the dentinal fibrils.

In a scurvy tooth the condition persists right up to the apex of the root; the trouble at first appears to start in the odontoblastic cells at the top of the pulp, working towards the apex, followed by distended blood vessels and haemorrhage, then complete fibroid degeneration follows.

With the object of obtaining some insight into the condition of the teeth of pregnant guinea pigs, I placed eight pigs, which were in a more or less advanced state of pregnancy, on a scorbutic diet, to study the biological relation existing between the mother and offspring.

Two of the guinea pigs that were used for this experiment were in the early stages of pregnancy, the remaining six being in an advanced state. The diet given, in each case, consisted of autoclaved milk, oats and bran. The pigs which were in the early stages of pregnancy died on the 11th and 13th day respectively, and death from intestinal infection was suspected.

Microscopical sections were made of the embryos of both pigs, but on account of the haemorrhagic condition and the very early stage of pregnancy, nothing could be discovered.

The six pigs that were in an advanced state of pregnancy all dropped their young at various stages of the experiments, from 11 to 15 days.

Microscopical sections were made of the teeth of the mother and offspring, and in every case an advanced state of scurvy could be seen. No. 5 will indicate the condition of mother, and No. 6 the condition of offspring, which are typical of results obtained throughout the experimental work which was afterwards carried on by Dr. Zilva and myself. It is not necessary to discuss the remaining cases of this group, as they all exhibited similar symptoms.

This work has to be carried out more extensively, as it is a little premature to make a positive statement, but the indications lead me to believe that the pigs during pregnancy are more susceptible to scurvy than when in a normal condition.

For the past four months I have been working on rickets, but my great difficulty has been to obtain material for histological work.

Advanced cases of rickets are not so common now as they were from 1890-1895, when artificial feeding of infants was at its height, and when less was known of the contents of artificial foods.

To-day if a child enters a hospital and rickets is diagnosed, a cure is brought about in a very short time; consequently, material to be had from infants for histological work is very rare indeed.

Mr. Sidney Spokes kindly gave me some old specimens, and from these I made a great many sections, which lead me to believe there is a great change taking place in the enamel organ. These sections are not sufficiently clear for me to exhibit here, as the material is very old and the sections I made are very poor, but the results are sufficient to show that the enamel cells are greatly deranged from the jaw of a child eight to nine months old. Mr. Spokes has kindly lent me his sections which he made from the same specimen when he first obtained it, a few years ago, and which is exhibit No. 9.

This work is to be further developed, and I expect within a very short time to have a considerable amount of material to work with.

The teeth were all decalcified in a solution containing 40 per cent. formaldehyd, 30 per cent. formic acid and 20 per cent. distilled water. This is a rather slow process, but I found it gave better results than the more rapid method. The rapid method which I used was to

decalcify with phloroglucin and nitric acid. This process will give very quick results, but is not so efficient as the slower method. After the decalcification was complete, sections were cut by freezing in gum and then staining with Ehrlich's acid haemotxylin and eosin.

Throughout the whole of the experimental work the earliest alteration to be noticed first takes place in the odontoblastic cells, in the upper part of the pulp, working gradually down to the apex, followed by dilatation of the blood vessels and haemorrhage.

CONCLUSIONS.

That scurvy does affect the pulp is indisputable, and is not a theory, but an absolute fact, a doctrine in the true sense.

The dentists who are working in infant and children's hospitals are the most fortunately placed to get reliable information for records that would be of great assistance in studying the development of the first dentition from a dietetic view. But this work, like all other medical research, has got to be carried on in animal life, if scientific results are to be obtained, and work that is carried on with animals that are always kept in cages and carefully watched and given a certain diet is bound to give a definite result if the experiment is repeated often enough. We have used considerably over 100 animals on this experiment.

I am obliged to confess that twelve years ago when I published my first article on the effect of artificial light on infants in regard to the calcification of the teeth, I certainly thought that it played a much more important part than the diet. It was while I was arranging my work to carry on my research still further with the artificial light that I was attracted by the work that was being done in the Lister Institute on scurvy. After having examined the teeth of several animals that had been given a scorbutic diet I found the pulp of the teeth was affected, even before any clinical symptom appeared in any other part of the system. This led Dr. Harden, Dr. Zilva and myself to believe that it was more important to go on with the dietetic experimental work than the artificial light.

Resume of Recent Literature on the Subject of Vitamines and the so-called Food Deficiency Diseases

[In view of the keen interest of the Dental profession in the subject of Diet and its relationship to Dental Disease, we publish, along with Major Wells' paper, a resume of the later work of McCollum and others upon the part played in diet by food substances of unknown chemical nature. E. V. McCollum, professor of Agricultural Chemistry in the University of Wisconsin, has together with his research

students, made some of the most important contributions to the literature of vitamins. The marked changes in the walls of the fine capillaries of the pulp in the guinea-pig resulting in hemorrhages throughout that tissue, would seem to be directly related to the pernicious bacterial flora developed in the intestine because of an indigestible residue of proteins, resulting from an unwholesome and inadequate diet, rather than to the absence of an "antiscorbutic substance." We desire to acknowledge the valuable assistance afforded by Dr. Harold K. Box in the selection of the following transcripts.—Editor.]

THE whole subject of vitamins continues to receive the most careful attention of the authorities on nutrition and of the investigators in the field of physiological chemistry. For many years there was no plausible theory to explain why a diet composed of purified proteins, fats, carbohydrates and mineral salts would not adequately nourish animals fed on such a mixture. Some supposed that phosphorous in some sort of an organic combination was the essential thing lacking in the above diet, but this was disproved. About 1911, Funk and other investigators working on this problem found that in the material rejected in polishing rice there was contained a principle which, when added to the inadequate mixtures composed of "purified" foods, was sufficient to render them entirely satisfactory. Growing out of this work came the vitamin theory of Funk, which postulates that a series of "deficiency diseases," such as beri-beri, scurvy, pellagra, and rickets, are due to the lack of certain unidentified principles in the diet. According to this theory, no matter how varied or large in quantity the diet of an individual might be, if it were lacking in these vital principles the person would be undernourished and would develop one or the other of the deficiency diseases. The work of Funk and others seemed to show that the vitamins were especially likely to be absent in the carefully purified and refined foods used by highly civilized communities. For instance, although grains and seeds themselves contain vitamins, the carbohydrates prepared from them, such as starch and sugar, and even polished rice, do not.

Later work has modified to a considerable extent the views of the scientific world in regard to this immensely important subject. Briefly stated, McCollum's work seems to show that instead of a whole series of essential principles or vitamins, as Funk supposed, there are only two, which McCollum designates as Fat-soluble A, and Water-soluble B. A diet deficient in Fat-soluble A is responsible for a group of symptoms the most prominent features of which are emaciation and xerophthalmia. The work of Block showed that a group of Danish children who had been fed on fat free separated from milk, and who were suffering from necrosis of the cornea, responded in a remarkable way to breast feeding, or to cod liver oil. This has been shown to be

due, not to merely correcting deficiency in fat, but to the Fat-soluble A, which is known to exist in butter-fat and cod liver oil.

On the other hand, a diet lacking in Water-soluble B will induce poly-neuritis, one form of which is the beri-beri, prevalent among the natives of India and Ceylon. This essential element is not present in fats, but is found in all, or nearly all, of the vegetables that have not been refined or purified by man. It is not found in starch or sugar.

Scurvy, which Funk had supposed to be caused by the lack of a certain vitamine in the diet, McCollum thinks, as do also Harden and Zilva of the Lister Institute, London, to be due to an entirely different cause. The prevention and cure of scurvy by orange juice and the juice of other citrus fruits apparently is not due to the vitamine supplied, but to the physical and chemical action of the citric acid in the juice. McCollum finds liquid petrolatum to be fully as efficient as orange juice in protecting animals against scurvy.

QUOTATIONS FROM RECENT WORK BY E. V. McCOLLUM.

There can no longer be any doubt that beri-beri is a deficiency disease in the sense in which Funk regarded it; viz., as due to the lack in the diet of a specific chemical substance, of which but a surprisingly small amount is necessary. To this substance he gave the name vitamine. He postulated without experimental evidence, however, the theory that certain other diseases, scurvy, pellagra, and rickets, like beri-beri, were caused by the absence from the diet of an adequate amount of similar protective substances. Thus, frequently he used the term "antiscorbutic vitamine" for the supposed protective substance against scurvy. In order to explain certain confusing experimental observations, Funk likewise suggested the existence of certain other "vitamines" essential for growth, which were not necessary for the maintenance of an animal. The idea of a group of "deficiency" diseases in this sense was very attractive, and the "vitamine" hypothesis has become very popular in the last few years. McCollum and his coworkers do not agree with Funk in including scurvy, pellagra, and rickets in the group of deficiency diseases, but they recognize beri-beri as such, and have described another, a type of xerophthalmia.

* * * * *

For a long time clinicians have been almost universally convinced that scurvy is a disease which is the result of a faulty diet. It was in the days of long voyages on sailing vessels of distressingly frequent occurrence among sailors. The men were forced to subsist for long periods on sea biscuits and salt meat. Scurvy is characterized by profound changes in the walls of fine capillaries resulting in hemorrhages beneath the skin, in the mucous membranes and other tissues, and in a

(Note—Underlining not in original transcript.—Editor.)

spongy condition with hemorrhage of the gums. There is also anemia and great weakness. The symptoms of scurvy promptly disappear when fresh vegetables, lime or lemon juice are taken in liberal amounts. Such observations led naturally to the belief that scurvy was due to the lack of something in the diet of stale bread and meats, which was furnished by the fresh vegetables and fruit juices. Since the relief of this serious condition by orange juice or other suitable additions to the diet is little less spectacular than is the "cure" of beri-beri in a pigeon, it is not surprising that Funk adopted the idea that scurvy, like beri-beri, is caused by the absence from the diet of a specific chemical substance, or "vitamine."

There is now apparently satisfactory proof that scurvy in infants and adults is due to the consumption of unwholesome food. It may result in certain species of animals as the result of taking food which is comparatively safe and wholesome for others. As an example; the guinea-pig, in nearly all cases, will suffer an attack of scurvy within a few weeks if fed exclusively upon a diet of rolled oats and milk, even of good quality. On such a diet the human infant, young rats or young farm pigs may grow well and remain in good condition. There can be nothing lacking from this mixture which is essential for the mammal during growth. Why does the guinea-pig usually develop scurvy, and why does the human infant sometimes develop the disease and sometimes thrive on such food? The answer seems to be supplied by recent investigations in which both human infants and guinea-pigs served as subjects.

McCollum and Pitz, after demonstrating that several diets which are entirely satisfactory for the rat during the entire growth period caused speedy decline and death in guinea-pigs, found that the latter animals could be relieved of the symptoms of scurvy, which they had developed as the result of being confined strictly to a diet of oats and fresh milk, by such remedial agents as liquid petrolatum, phenolphthalein, and also by the administration of an "artificial orange juice" prepared from pure inorganic salts, cane sugar, and crystalline citric acid, in proportions similar to those found in the edible portion of the orange. Orange juice has long been recognized as a very efficient food for the relief of scurvy in man, both infants and adults. The accepted explanation of its potency has been that orange juice contains an *antiscorbutic* substance which, according to Funk, is to be classed as "vitamine."

The real explanation of the susceptibility of the guinea-pig to scurvy is, according to McCollum and Pitz, to be found in the peculiar conformation of its digestive tract. The cecum, a pouch lying between the small and large intestine, varies remarkably in different species of animals. In the guinea-pig, the cecum is of extraordinary size and its walls are very thin and delicate. Their power of contraction is small,

and it is not possible for the animals to pass the contents of the cecum into the large intestine unless the material possesses very favorable physical properties. The guinea-pig can thrive only on a diet which contains a liberal amount of some succulent vegetable, such as cabbage or carrots. These produce bulky, easily eliminable feces, and such a diet tends to keep the digestive tract in a hygienic condition. Both oats and milk are constipating foods. When this species is confined to a diet of oats and milk, the cecum soon becomes packed with feces, and extensive putrefaction takes place in the stagnated contents. Scurvy is in some way related to the bacterial factor which accompanies this condition, but whether bacteria actually invade the tissues, when the cecal wall is injured by prolonged contact with decomposing feces, or whether the destruction of the capillaries is the result of the absorption of toxic products of bacterial origin, is not determined. Jackson and Moore have found a diplococcus in the haemorrhagic areas of guinea-pigs suffering from scurvy as the result of a milk and oat diet, and they are inclined to attribute to this organism a casual relationship to the disease.

Following the studies just described, Hess demonstrated that infants fed on milk, which had been pasteurized immediately before feeding, do not develop scurvy, while others fed the same milk, which was kept twenty-four to forty-eight hours after the heat treatment, may develop the disease. Boiled milk, on the other hand, is not liable to cause scurvy in infants. The reason for these results appears to be found in the bacteriological condition of the milk treated in these different ways. Pasteurization destroys the lactic acid forming organisms but not certain spore-forming bacteria. The latter develop rapidly in milk in which there is not the normal rise in acidity, i.e., pasteurized milk. After a day or two, therefore, such milk is a well-developed culture of organisms which may in the delicate intestine of the human infant cause abnormal decomposition of the proteins with the formation of products which are irritating to the mucosa, cause injury, and possibly permit the invasion of the tissues by organisms. Boiled milk is nearly free from bacteria, so it is less dangerous than old pasteurized milk. Milk which has been pasteurized and is fed soon thereafter is without detrimental qualities, because the forms of organisms, which cause the damage, are not permitted to develop and accordingly but few are ingested.

The evidence is convincing that scurvy is liable to follow the use of stale foods. If, however, the disease develops in those who use desiccated foods, canned or preserved foods, the cause is to be sought in the bacteriological condition of the food, and not, as has been frequently asserted, in the destruction of some hypothetical "vitamine." There is no protective substance against scurvy in the sense that there is

against beri-beri, or the type of xerophthalmia described as resulting from specific starvation for the dietary essential, fat-soluble A.

Scurvy in the long sailing voyages of the past was probably the result, first, of the poor quality of the food (biscuits and stale meat), which did not form an adequate diet and caused depletion of the vitality of the sailors. Constipation and perhaps also, as Hess suggested from his observations on infants, failure to urinate sufficiently formed the preliminary conditions which permitted the development of the bacterial flora which finally brought on an attack of the disease. Fresh vegetables and fruit juices relieved the condition for three reasons; first, they did much to render the diet complete from the physiological standpoint, which alone would greatly promote recovery; second, they were good correctives for the faulty elimination, because of their bulk and the water-holding capacity of their indigestible residues; and third, especially in the fruit juices, the diuretic property would cause a thorough washing out of the tissues. A diet of wheat biscuits and meat is inadequate with respect to two chemical factors; its organic content is entirely inadequate, and it is lacking in the factor, fat-soluble A. What there is of indigestible residue consists mainly of protein residues, which would favor the development of a pernicious flora in the intestine.

Such a tentative explanation as that just offered harmonizes well with the experimental facts. The most convincing evidence of the general correctness of this view of the etiology of scurvy lies in its experimental production with diets which are known to be complete chemically, and which nourish well certain species of mammals that do not suffer from special anatomical disabilities, because of the peculiar form of the digestive tract. The relief of the disease by several means, none of which can possibly be interpreted as supplying a hypothetical curative substance, an "antiscorbutic substance," which would be considered as analogous to those which are concerned with the relief of beri-beri and xerophthalmia, eliminates this from the list of so-called "deficiency" diseases.

* * * * *

Rickets is a nutritional disease, the most prominent feature of which is an alteration of the growth of the bones. These become enlarged at the extremities and so soft that they bend as the result of muscular contraction or by reason of the weight of the body resting upon them. It is a disease of the first two years of life and is associated with faulty diet. It is of frequent occurrence in cases where milk in the diet is replaced too largely by cereals or other foods not suited to the digestive tract of the young child. In many cases tuberculosis and syphilis are predisposing factors. The symptoms develop gradually. There is restlessness and perspiration during the night and great sensitiveness

of the limbs, even a light touch being very painful. There are gastric disturbances, especially colic and distention of the intestine with gas, so that the abdomen protrudes. The bones become thickened and nodules develop at the juncture of the ribs with the costal cartilages, forming the characteristic "beaded ribs." There is defective ossification of the skull; the teeth appear later than normal and in unusual order. Various deformations of the head, spine, chest, and limbs result as the child develops. Recovery with deformity is of frequent occurrence.

Although there has been no thorough study of this disease from the dietary standpoint, the well-known dietary deficiencies of the cereal grains, together with the extensive injury to the intestine, which is evident from the distended abdomen, its occurrence only in very early life and its association with infectious disease, make it unnecessary to invoke the aid of any hypothetical "vitamine," to a lack of which the disease may be attributed. The facts are now sufficiently established, therefore, to warrant the complete confidence in the belief that scurvy, pellagra, and rickets, while referable to faulty diet, are not to be regarded as "deficiency" diseases in the sense in which this term has been generally employed during the past seven or eight years.—*The Oxford Medicine*.

Some of the Changes in the Deciduous Molar and First Molar Regions Approaching and During the Transitional Period

R. L. DAVIS, D.D.S., TORONTO.

IN viewing normal arch of child before transitional period, the line of occlusion of the teeth is found to be a plane, not a curve as in the adult, deciduous molars and first molars vertical in position, and distal relation of first molars nearly a vertical line.

The first molars have erupted to the occlusal plane of deciduous teeth and functionate as deciduous teeth up to transitional period. On approach of transitional period the deciduous molars elongate a little, this no doubt due to on-coming premolars (bicuspid), and as a result of this have a freeing of first molars from forces of occlusion and allowing them to further erupt, and so establishing a new occlusion here which they will have to maintain alone until premolars and second molars erupt, and assume their functions.

The shedding of deciduous molars is followed by eruption of premolars, uppers first, and as these teeth have a smaller mesiodistal measurement than deciduous molars, the first molars drift forward 1.5

m.m. in upper and 3.5 m.m. in lower, and uppers tip buccally and lowers lingually slightly.

The movement is aided by pressure from second molar, and this is another of nature's periods of growth in which changes are made in lower third of the face, and if above is what takes place, may say that the bite is opened at this period by elongation of deciduous molars in accordance with nature's plan to add depth to face and to finally establish the occlusal curve—the natural retainer.

The first molars now have assumed the adult positions of Class I. of Dr. Angle, or the position of neutroclusion of a later nomenclature.

While this is going on, changes are also taking place in other regions.

RESULTING CONDITIONS FROM PREMATURE LOSS OF DECIDUOUS MOLARS OR FROM LOSS OF SUBSTANCE WHICH AFFECTS CONTACT POINTS OR OCCLUSAL SURFACE.

With premature loss in deciduous molar region, arch continuity being broken, the first molars under pressure of second molars may drift forward (distance according to loss) more than they should at transitional period. They also take on a mesial tip, and often a direct result of this is that there is not sufficient room for premolars to erupt.

From break in arch continuity we have an interference with nature's plan of forward development in this region.

From loss of occlusal substance there is no drifting unless continuity of arch is broken by loss of contact; but when the occlusal substance is lost, although elongation (spoken of above) of remainder of teeth takes place, the first molars are not relieved from forces of occlusion, and so are not free to erupt towards adult position.

With the loss of substance in deciduous molars, there is a closing of the bite, the lower incisors slide along lingual inclined planes of upper incisors, and eventually in some cases meeting palate of upper.

The lower anteriors are in lingual-version, and the uppers after a time are also in lingual-version, due to lip pressure.

The heavy overbite changes very much the contour of lower third of face—appearance is given of too much tissue around the mouth, and mouth and chin too close together.

In some cases, may find quite a congested area around upper incisors, caused by wrong occlusion of lower incisors.

May have a condition where laterals are not free to erupt, also a pinching in of upper cuspids.

The prevention and removal of causes of the abnormal overbite forms one of the great problems in the work of preventative orthodontia in our schools to-day.

A FEW SUGGESTIONS.

No doubt these suggestions have been presented time and time again, but think they should be ever in view:

If by imparting knowledge by means of talks, demonstrations from models and patients, to mothers' clubs, placing the vital knowledge of teeth and mouth in a text-book to be used daily in our schools, dental clinics in schools, talks to be given by dentists in all schoolhouses of province, knowledge imparted by dentist to patient, we can secure proper care for the deciduous teeth of the children, we will be advancing a long way towards solving the dental problems, especially those of an orthodontic nature, and through these a great many of the others as they confront the dental profession to-day.

The object of this article is to try and show that if we expect nature to do her full duty and to obtain normal development in deciduous molar and first molar region, as well as in other regions, arch continuity and occlusion must be kept as nature intended, and in case of loss of tooth or teeth, space should be held, as this will help, but in cases of this kind feel sure patient will never have the efficient arches and contour of face nature intended if corrective means are not employed.

Obituary

WORD has just come of the death in France of Capt. W. T. Hackett, C.A.D.C., of pneumonia. Dr. Hackett was a graduate of the Royal College of Dental Surgeons, 1899 class, and started practising in Bolton and West Toronto, and in 1909 moved to Winnipeg, where he lived until joining the C.A.D.C. in March, 1916. Not being able to get to the front as soon as he desired, he took a lieutenant's course in the 169th and reached England. There he rejoined the C.A.D.C. and was sent to France in May, 1918, where he has since been. The last communication from him was from France in January, where he had been rendering excellent dental service to the troops.

Dr. Hackett was a member of the Mystic Shrine, a Methodist, and a staunch Conservative. He was also a charter member of the Omercrom Chapter of the Xi-Psi-Phi Fraternity.

TINCTURE OF BENZOIN instantly relieves pain from exposed process. Cover the exposed process with a pellet of cotton saturated with tincture of benzoin.

FEATHER-EDGES ON GOLD INLAYS.—To avoid "feather-edges" on cast gold inlays at the gingival border, insert the sprue in the wax pattern on the occlusal surface—never on the contact point or approximal surface.—*Victor H. Fuqua. (Dental Cosmos.)*

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

ROOT CANAL OPERATIONS.

DR. ELMER S. BEST recently read a paper before The First District Dental Society, S.N.Y., in which he presented some of the impressions of a visit to the Mayo Foundation. This paper is reported in detail in *The Journal of The Allied Dental Societies*, December, 1918. In these few words he sums up his position with regard to pulpless teeth: "No teeth must be removed unnecessarily and yet no diseased conditions must be left. If a pulpless tooth and its supporting alveolus cannot be rid of pathological conditions in any other way, it must be extracted."

Taking up the question of tooth treatment, Dr. Best has much to say that will be of great interest for all of us. He would have us always make an examination of the tooth and surrounding tissues so as to determine very accurately whether or not a root canal operation is indicated. Having decided upon the treatment of the tooth we ought to carefully remove all decay in the tooth previous to placing the rubber dam in position. Then the teeth that are so isolated by the dam are wiped off with iodine and alcohol. If we have decided to remove the vital pulp by means of an injected anesthetic, then the injection is made previous to placing the rubber dam. With the canal freely opened up a small amount of formalin is applied, on a pledget of cotton, to the pulp tissue. This is for the purpose of toughening the tissue and so facilitate its removal. A suitable barbed broach is selected and used to remove the tissue. As each canal is cleaned of its pulp it is sealed up with oxychloride of zinc and attention directed to the other canals. In this way the possibility of contaminating the cleared canal is reduced to a minimum. In constricted canals where the finest barbed broach will not go, then try an apex broach, and if necessary use a smooth broach with sodium-potassium or sulphuric acid 30 per cent. These solvents will soften the dentinal wall, and the canal may be enlarged by means of broaches. A sterile paper point is then inserted and sealed in until all the canals are made ready for the filling. If the X-ray picture shows this part of the work to have been done satisfactorily, then the permanent filling may be gone on with at once. If, however, the

operation cannot be completed at this sitting, seal in the canals a very mild dressing of oil of cloves, covering it securely with oxychloride of zinc cement, and moisten the cavity with xylol and fill with temporary stopping. (Xylol may be used very satisfactorily to remove gutta percha from incompletely filled root canals.)

Greater care is required in preparing teeth for filling in which there are dead gangrenous pulps. It is best to culture the canals and wash cautiously with 1 per cent. chlorosene, using a pulp canal syringe. Formo-cresol is then sealed in. At the next sitting the dressing is removed and sodium-potassium used in the canal, taking care not to enter the apical third. This solution is then neutralized with bichloride of mercury and the entire canal dried carefully. Formo-cresol dressings are renewed from time to time until the canals are free from bacteria.

For sealing up the foramina, a piece of gutta percha cone is condensed into the apex by moistening with rosin and chloroform. Just at this time we are free to remove all infected dentine from the canals and also effect their enlargement. This is best accomplished with heavy barbed broaches and Kerr files. Chloro percha is now used to complete the canal filling and oxychloride of zinc cement to seal over the orifice.

Recently Dr. Howe advocated the use of silver nitrate in root-canal work, and its use has presented some difficulties to at least a few operators. For the benefit of these men Walter F. Provan, D.M.D., of Boston, offers a few suggestions through the Dental Cosmos. He finds that satisfactory results in the use of this solution are obtained most easily if the canals are thoroughly cleaned out before attempting to make the application. Again, it is very necessary to get the solution (solution No. 1) to the apex. Capillary attraction will not take it there if the root canal is dry, because air will be caught in the upper end of the canal. Difficulty is experienced in attempting to dislodge this air with a smooth broach, and there is the added danger of lacerating the tissue beyond the end of the root. To avoid this dip a cotton point (Johnson and Johnson) in solution No. 1 and insert it in the canal, forcing the point well up to the apex. Owing to the softness of the point the tissues cannot easily be harmed. It is possible at the same time to moisten the walls of the canal with the solution. Next, a drop of the solution is introduced into the pulp chamber with a pair of cotton pliers. With a smooth broach work the solution to the apex of the canal. Allow it to remain for three or four minutes, and then follow with a drop of No. 2 solution. Again wait three or four minutes. The canal is now dried out slightly with a cotton point and again a drop of solution No. 1 is inserted. This is followed by a drop of eugenol, the mixture being worked into the canal by means of a smooth broach. After a few minutes all excess moisture is dried out with cotton points and some

chloro-percha introduced until the root canal is full. A packing of gutta percha points completes the filling. Cement is poured over the canal opening and all is then ready for the tooth filling.

The advantage claimed for eugenol by Dr. Provan is that it prevents soreness following the use of the silver nitrate solution in the canals. In a few cases he is prepared to admit soreness may occur, and explains it as follows: "The precipitation which follows the addition of solution No. 2 and eugenol to solution No. 1 seals the apical foramina if they are small, and if they are large the gutta percha filling does it. This precipitation effectually sterilizes the root canal, and with the gutta percha filling cuts off any subsequent re-infection from this source, but there is an apical infection existing which has not yet been dealt with, and nature has to clear up this infected region. The vent for gas or pus has been sealed, and unless these can be absorbed as fast as they are formed, soreness is sure to develop. If this kind of trouble arises and pus forms, do not ream out the root canal. A lancet thrust will give relief, and the case will clear up of itself."

REDUCING SENSITIVENESS OF THE DENTINE.

In a recent issue of *The Digest*, Dr. E. S. Ulsaver writes about the merits of oil of cloves and oxide of zinc as a temporary filling material. Many of us have been using this constantly, and can speak favorably regarding its efficiency. In case there are some who have not used it a brief outline of the method of manipulation may prove of interest.

The oxide of zinc and oil of cloves should be mixed to a very thick paste—so thick that when patted with the spatula just a trace of moisture may be seen. Placed in the cavity, it soon hardens when in contact with moisture, and may remain in place for about three months. A bur or sharp excavator is required to remove it. Upon testing a cavity that has been filled with this mixture for a short time you will find the softened dentine so dried out that it may be excavated without any pain to the patient.

At the beginning of the day's work mix up a "rope" of this cement and from time to time cut off a piece as required. If the mass becomes unworkable through drying out, simply spatulate with a little added oil of cloves and it will be again ready for use. There need be no wasting of this material and its preparation is inexpensive.

A NEW LOCAL ANESTHETIC.

A new product of the Parke, Davis & Co.'s laboratories is designed to take the place of Novocain as a local anesthetic, according to the report of "The Texas Dental Journal." This product, known as Apothesine, is known chemically as the hydrochloride of gamma-diethyl-amino-propyl cinnamate. It occurs as small white crystals, having a melting point of 137° C. It is readily soluble in alcohol,

slightly soluble in acetone and ether, and very soluble in water. It is quite stable, and if kept free from contamination will keep indefinitely. If so required, the solution may be sterilized by heating to the boiling point of water. Freshly prepared solutions give the best results. For the convenience of the profession this anesthetic is prepared in the form of tablets, each tablet containing 3-5 gr. apothesine and 1-500 gr. adrenalin. Its toxicity is about the same as novocain, and it has the same resistance to boiling.

In the March, 1917, edition of the "New Orleans Medical and Surgical Journal," C. W. Allen, M.D., of New Orleans, reports the results of some experiments with the material. He experimented upon himself with a one per cent. solution of apothesine and found that it produced immediate anesthesia of the skin. He found that if injected too rapidly a slight, negligible burning sensation was noticed, which immediately subsided. This sensation was at the site of the needle puncture. If the solution was injected slowly no such sensation was experienced. Complete anesthesia lasted for one hour and a quarter. A one per cent. solution of apothesine, with the addition of five drops of the 1:1000 solution of adrenalin to each ounce thereof produced a similar result except that the pale area surrounding the wheal, produced by the injection, was more marked. The one half of one per cent. solution of apothesine with sodium chlorid four per cent. produced immediate anesthesia that continued thirty minutes. The addition of adrenalin solution, five drops to the ounce, prolonged the anesthesia to forty-five minutes. The one-fourth of one per cent. solution produced practically the same results. He found as a result of various experiments that in its anesthetic effects and low degree of toxicity, this new anesthetic compared very favorably with novocain. Various operations, such as circumcision, hernia, hemorrhoids, fistula, varicocele and plastic operations were performed with the aid of apothesine, and, says Dr. Allen, "the anesthesia has been complete in all cases, and has invariably lasted in excess of an hour. No immediate or late irritating effect was noted, and the wounds healed as well as after the use of any other anesthetic solution. No toxic or other unpleasant immediate or after effects were noted, although large quantities were purposely used to determine this point: as much as four ounces (of the solution) in one case, which represented nearly ten grains of the drug."

A GOOD FEATURE OF THE WAR TAX.

It is quite possible that even an ill-wind may blow some good. The recently levied war tax on incomes, though quite generally hated, may ultimately prove to be a blessing in disguise. It may be the means of certain dentists, as well as other professional men, indulging in less braggadocio. This will be good for everybody—the public will think more of our profession and our colleagues will enjoy our company more. There is not a very great difference between the

boaster and the out-and-out prevaricator.

The new income tax may prove to be a "booster" for dental gatherings. One of the reasons sometimes given for non-attendance at these gatherings is that some men take advantage of the situation to advertise themselves in a way that often proves distasteful to the ethical practitioner. One is apt to come away feeling somewhat of a failure after having listened to a recitation of enormous fees received by these men. In future these self-advertisers will be conspicuous by their absence, for it does not pay to boast of your income now. The tax collector may get you if you don't watch out. So perhaps we are in for a blessing even though it comes in disguise.

Where did this boastful spirit get its inception? It is just possible that our teaching institutions are somewhat to blame for it. Any school that focusses attention on "fees" rather than "service" is sure to graduate dentists whose chief enjoyment seems to be in acclaiming the largeness of their income. Such an attitude does harm to our profession.

The editor of the "Dental Review," whose criticisms are given in such kindly fashion, takes up this question in a recent editorial. On account of the excellence of his advice, and the high esteem in which he is held by the profession at large, we shall place before the reader his views. Dr. Johnson writes about the folly of posing. He says: "There is a species of folly growing up in the profession which can do little good and much harm. It relates to a propensity on the part of some men to pose before their fellows regarding the amount of practice they do and the enormous fees they receive. It is in a way the direct heritage of the propaganda for practice-building that raged so extensively a few years ago, and with this as with the other it is quite likely to bring discredit on the profession. To get good substantial fees for service well rendered is perfectly legitimate and wholly commendable. It places the profession on a higher plane to have the impression go out that dental service is worth a good fee, and it creates an incentive to do the best work to have that work well rewarded. But to get an abnormal fee for ordinary work is demoralizing to all concerned, and worse yet to pose as getting higher fees than other men just for the purpose of making an impression. The chief harm is done not to men who have been for some time in practice, because they know only too well the type of man who makes these boastful claims, but when a young practitioner who is struggling along in the face of various kinds of handicaps, and who has to content himself with moderate fees, listens to one of these siren songs from the lips of a poser, he is inclined to shrink into his shell and put himself down as a failure. . . . It does not conduce to peace of mind when a young man who is having an uphill road in practice is told by another: 'My practice has never run less than a thousand dollars a month from the start.'"

There is an old saying to the effect that all is not gold that glitters. This expresses fairly well the point of view that Dr. Johnson would have the young practitioner take. There may be a few cases where extraordinary fees are earned by the new beginner, but they are only occasional cases, and do not represent the general run of practice. A casual survey of the income tax schedules handed in by these shining lights of dentistry will show to what extent their boastings are pure fabrications.

It is well to bear in mind that the real leaders of our profession consider it indecent to boast of their earnings and are seldom heard discussing the largeness of their practice.

The John R. Callahan Memorial

AT the December, 1918, meeting of The Ohio State Dental Society a resolution was adopted to perpetuate the memory of the late John R. Callahan in recognition of his contributions to the science and art of dentistry and his unselfish devotion to its advancement throughout the many years of his professional life.

The Committee to which this Memorial was referred has decided on the following as the most appropriate, and worthy of the approval of the profession.

1st—A bronze memorial to be placed in The Cincinnati General Hospital Grounds.

2nd—A Callahan Memorial Research Fund, the income from which to be awarded from time to time to the person making the best contribution to the science and art of root canal problems. The Fund and Award to be under the direction of a committee perpetuated by The Ohio State Dental Society. The prize to be known as The John R. Callahan Award.

The sum necessary in the minds of the Committee to carry out the memorial in its two phases should approximate \$8,000.00, an amount that should speedily be raised in these times when the spirit of giving is universal.

Subscriptions to this fund by individuals or societies will be duly credited and should be forwarded to the Secretary-Treasurer of the Fund.

T. IRVING WAY, *Chairman*,
52 Groton Building, Cincinnati.
HENRY E. GERMANN, *Secretary-Treasurer*,
719 Gwynne Building, Cincinnati.
L. L. BARBER, Toledo.
WESTON A. PRICE, Cleveland.
L. E. CUSTER, Dayton.
EDWARD C. MILLS, Columbus.
Committee.

Silver-Ammonia-Formalin Technic for the Sterilization of Tooth Structure

BY W. A. CHAMBERLAIN, D.D.S., ST. LOUIS, MO.

TO those who have been interested in root-canal work and are familiar with the difficulties of sterilizing tooth structure, the ammoniacal silver-nitrate method as first advocated by Dr. Percy Howe, in September, 1917, issue of the *Dental Cosmos*, is of vital interest. It is, as far as can be learned, the most positive method yet advocated. The only objection to it is the consequent discoloration of the tooth, and this objection which stands out preeminently at first, is greatly modified by conditions and technic of application.

There can be no objection to its use in posterior teeth under crowns or in deciduous teeth. By properly protecting the crown-half of the canal with wax or some varnish it may be used without the disfiguring discoloration in bicuspid and anteriors.

Aside from the positive effectiveness of this method in sterilizing tooth structure there is another thing which recommends it. It simplifies root-canal work.

In view of the information passed on to the dental profession by our Research Institute, that formocresol as well as the long list of drugs commonly in use, also ionization, do not sterilize tooth structure, this method in its present much-perfected technic is of vital interest. It should be welcomed by all; by those who are endeavoring to follow the methods of our authorities, as well as those who are not, because of the time and difficulties involved.

It seems to be effective in sealing the minute foramina and fixing those shreds of canal tissue which cannot be removed with instruments. It penetrates the canals, which cannot be opened with broaches; it will I believe be the first step in perfectly fixing the pulp and canal contents *in situ* making a perfect canal filling.

Dr. Ewing Brady, of St. Louis, whose investigation and research is very extensive, has taken up this silver nitrate method and gives what will, in my opinion, evolve into what will not only sterilize tooth structure but fix pulp and canal tissue.

Dr. Federspiel, of Milwaukee, has been working in this direction with positive beliefs in his ultimate result of fixing pulp and canal tissue. That is, impregnating the tissue and tubules with an insoluble chemical, thereby fixing them against decomposition and further infection.

BRIEF HISTORY OF THE USE OF AgNO_3 IN DENTISTRY.

The use of AgNO_3 in dentistry has been general for a very long time and is more or less familiar to all dentists. Some, such as Conrad, have used it very extensively in preventive work. They have made application of it, at frequent intervals, to all tooth structure with a view of checking and preventing caries.

Others have used it for desensitizing dentin and for sterilizing decayed tooth structure overlying vital pulp tissue. It has been used to a great extent in handling the deciduous teeth.

By far it has found its greatest use in the past to desensitize exposed root surfaces. Here the AgNO_3 penetrates the tubules, forming a supposed insoluble silver albuminate which if allowed to turn black on exposure to sunlight, has a very lasting effect.

Dr. L. P. Bethel, in the *Ohio Dental Journal*, 1896, advocated the cataphoric application of silver nitrate for the sterilization of infected root canals, but no doubt this method did not attract much attention because of the views prevailing then regarding root-canal work.

About the year 1911, Dr. ———, of South America, placed on the market a preparation consisting of asbestos fibers soaked in AgNO_3 which was packed in root canals and a reducing solution used afterwards.

Dr. Howe's original methods called for two solutions.

Solution No. 1.—Consisted of a saturated solution of AgNO_3 in water, to which was added 25 per cent. ammonia water. As the ammonia was added, a dark precipitate was formed which was soluble in an excess of ammonia so that the addition was continued until the solution was clear.

Solution No. 2.—Was a 25 per cent. solution of formaldehyde. At the time of the meeting of the National Dental Association in New York, October, 1917, he advocated a modification of the original. The new technic called for the ammoniacal solution made so as to have the silver nitrate slightly in excess of the ammonia.

In order to get away from the irritation of an excess of the ammonium hydroxid, his new method was to add ammonia until a clear solution was obtained; then add the smallest possible amount of AgNO_3 which would produce a precipitate.

The second solution instead of being a 25 per cent. solution of formaldehyde, he changed to a 10 per cent. in order to reduce the possibilities of the bad effects of the formaldehyde.

In his article he was of the opinion that this technic alone would take care of conditions of putrescence and sepsis in the root canals, also penetrate canals inaccessible to the broach as well as fix the shreds of the pulp tissue which could not be removed.

The theory of all this is that the ammoniacal AgNO_3 has considerable affinity for albumin, consequently penetrates pulp tissue, dentinal tubules and canals.

This being followed by CH_2O a precipitate of free silver is thrown down. Any excess of CH_2O above what is required to reduce the AgNO_3 can be regarded in the light of our authorities on root-canal work.

This ammoniacal AgNO_3 method as can be seen, has a great

advantage in root-canal work over straight AgNO_3 which if used would coagulate the albumin and limit decidedly the penetrating effects of the drug.

In my opinion, the use of ammonium-silver-nitrate is indicated in all canals immediately preceding root-canal fillings. In putrescent canals, other drugs should be used first, preferably Dakin's solution, to overcome the possibilities of infectious material from being forced through the apex. Dakin's solution acting by virtue of chlorin gas penetrates the putrescent mass more readily and suppresses the facultative anaerobies.

Sodium potassium may be used but care should be used to wash out products formed and this followed by an acid, phosphoric acid being suggested because it is always at hand.

All canals should be enlarged to facilitate filling. NaK helps in this. Even in canals from which vital nerves have been removed, the use of H_2SO_4 , 10 per cent. just before the AgNO_3 is applied leads to a greater deposit of silver.

After the preceding technic has been followed, dry the canals and apply ammoniated silver nitrate on a broach carrying a wisp of cotton, pumping the solution into place. Allow it to remain three minutes at least and longer if desired. Dry again and apply the reducing solution.

The recognized fact of AgNO_3 being a germicide by coagulating the proteins of the cell recommends it for use in this particular kind of work. However, because of the self-limiting property of AgNO_3 , ammoniated AgNO_3 will penetrate these cell contents without coagulating the albumin. This also furthers the penetration of the drug in Tomes fibres. When the reducing solution is used the AgNO_3 is thrown down within the cells and thus the organic matrix of the dentin is impregnated with silver and fixed, preventing the field from becoming fertile for proliferation of micro-organisms.—*Dental Summary.*

METASTATIC EYE INFECTIONS FROM DENTAL FOCI.—In a series of 57 patients suffering from some form of infective eye disease a large percentage showed a direct connection between the ocular condition and the dental infection. The authors believe that the eye lesion was not contrary to the usual opinion, of hematogenous origin, but was due to direct lymphatic spread. In support of this was the fact that the dental lesions were on the same side as the affected eye in a large proportion of cases. The intimacy of these two lesions in a casual sense is manifested by the fact that over half of the cases were cured or benefited in respect to the eye condition by dental treatment, and in all but one of these the dental infection had been on the same side as the affected eye.—*Joseph M. Levy, W. F. C. Steinbugler, and M. C. Pease. (Dental Cosmos.)*

MULTUM IN PARVO

This Department is Edited by

C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

ACETOZONE.—This substance, another of the series of “ideal anti-septics,” is stated to have great advantages over our old and tried friend hydrogen dioxid, which, as most of us know, is unstable and momentary in its oxidizing power. Acetozone, chemically described as “benzoyl-acetyl-peroxid,” and used in aqueous solution, is said to be stable, non-irritating, to have no inhibitive effect on phagocytosis, also to be very rapid in action and effective in septic wounds that have resisted all other forms of treatment.—*British Dental Journal*.

THE GENERAL'S TEETH.—The following story of “a distinguished general now commanding an army in France” is vouched for by the *Times of India*, of Bombay: In the retreat from Mons he and his division, after ten days of no rest or sleep, reached a village. The pursuit slackening, he joyfully snatched the opportunity of houses and beds to get between the sheets for a brief time. After just twenty minutes an A.D.C. rushed in with the news that the Germans were coming. Out jumped the general, dressed in the dark (no time for candles), sallied out, and continued the retreat. Now you must know his front teeth had been carried away in the Boer war by a spent bullet, and had been replaced by a false set. But these in the hurry he forgot, and so the retreat went on to the Marne, where it was the Germans' turn to retire. After a fortnight the general was back in the same village where he had tried to sleep, but it was all in ruins, the house just being four walls and a floor or two. Nothing daunted, an A.D.C. announced his intention of going back and looking for those teeth, taking some men to help him. He searched among the debris, and there, under a mass of chicken bones and champagne bottles, and undamaged, were the precious teeth. They were carried back in triumph to the general, who before long enjoyed a change from porridge and slops to a good square meal of bully beef.

RICKETS AND ERUPTION OF THE DECIDUOUS TEETH.—Rickets is certainly an important cause in the delaying the eruption of the deciduous teeth, in 76 per cent. of the cases of rickets, according to Dr. Still, the first tooth being delayed, occasionally even to the eighth month. Rickets also induces an unstable condition of the nervous system, which renders teething a source of danger to the infant, so

that such children are very liable to convulsions during dentition. As to causation the generally accepted view is that rickets is due to excess starch in the food, or deficiency of fat, but especially if both causes are combined, as is often the case in patent foods, so that an infant may develop the disease even if no starch is given, if the milk is too dilute and hence contains too little fat.—*T. Wilson Smith (British Dental Journal.)*

WHAT DENTISTS SHOULD KNOW ABOUT ORTHODONTICS.—It is surprising that since the work of Angle so many dentists disregard or are ignorant of the fundamental laws of orthodontics.

These are a few of the points which every dentist should know:

1. From the orthodontic point of view the extraction of the first molar spells disaster, the dental becomes narrow and the articulation will be considerably disturbed.

2. The extraction of premolars or canines displaces the median line.

3. The deciduous teeth must all be preserved until they are lost naturally; the second temporary molar is particularly important, because in the case of its extraction the first permanent molar will come forward and bring about an abnormal occlusion.

4. If the articulation of the first molar is too low the lower incisors press on the palatine surface of the corresponding upper teeth and produce prognathism of the maxilla. The bite must be raised. A small patient was shown whose articulation was in process of being raised, and in such a case it is necessary to treat it as early as possible. Every malocclusion must be treated early, and it is our duty to point it out to the parents of our young patients as soon as it appears.—*W. M. Fitting, D.D.S.*

CAPT. TEETZEL'S METHOD FOR RETAINING DENTURES IN FLAT HARD SURFACES.—For lower dentures make a groove about the thickness of an ordinary pin in depth and width around the model before packing about a millimetre from the edge of plate when finished, then after the flask is packed cut a strip of unvulcanized rubber about a millimetre wide and carefully cover the groove — by using a little chloroform on rubber it may be made to stick to plaster model; when properly completed a narrow ridge of soft rubber will come in contact with patient's gum tissue and form a cushion and suction. A similar proceeding may be used on upper case, but I have found a groove around the air chamber treated as above quite satisfactory. Another method is to pack a space two or three millimetres wide all around the ordinary air chamber. A lip can be made on this soft rubber around the air-chamber by bevelling the edge of the air chamber metal and fastening on mold over a sheet of soft rubber cut quarter inch larger than metal and a hole cut slightly smaller than metal. Using above methods there is no need of failure in retaining dentures.



Getting Even With People

WE waste a deal of energy trying to get even with people who do us a wrong, whether real or fancied. Nothing could be more foolish or fatal, nothing more fruitless. Even if we are wronged we do not make matters any better by retaliating in kind. Two wrongs do not make a right, in fact they compound the wrong many times over. We really accomplish nothing even if we work an injury as great as the one that was done to us. It is no satisfaction to see a man suffer just because we have suffered—it does not help our hurt.

The best way to get even with a man is to do him a kindness in return for an injury. That is a very difficult thing for us to do; it is counter to the tendency of human nature. But the moment we do it we have the advantage. Nothing disarms an opponent so surely as to meet his meanness with a kindly spirit. Nothing gives us strength like rising above resentment and conquering retaliation. We have won two victories—the victory over ourself and the victory over the situation. And we have added happiness to the sum total of our achievement. We can never be really happy if we bring our opponent to time by brute force, or by the play of wits. Any victory gained in this way is only a hollow victory without any true triumph in it.

How prone is the old Adam within us to rise up and assert itself—to demand an eye for an eye, and a tooth for a tooth. As if the loss of our enemy's eye would restore our own, or make us see better with the one we have; as if we could be happier to have others suffer.

We have not gone far on the road to moral development or strength of character if we glory in the discomfiture of others, whether they have wronged us or not; but we gain a real victory if we subdue the resentment within us and are able to meet the wrong-doer in a spirit of charity and forgiveness. Not that we shall "turn the other cheek" if smitten on the one—not by any means—but that we shall

keep the other cheek out of the way and refrain from smiting in return. We have done well if we have done that. We cannot reconstruct our whole nature at once, because we are far from being divine, and we make a failure of it if we assume to attain divinity. We become grotesque and do not fit into the sphere of mundane things. For after all we are of the world, and are perforce obliged to deal with practical matters.

We shall do well if within the next hundred years we succeed in forcing the spirit of resentment and retaliation out of our hearts, and this we must aim to do. The task is not so hopeless as it might seem. Think of what has been accomplished since the days of the man of the cave. Think of the early struggles of the race when the chief pursuit of man was war with his fellowman, when to kill and rob was legitimate and even laudable, when to get even with an enemy was a virtue. The days of the most primitive justice were long in the forming, and the theory that might makes right died hard.

It is true that we at times revert to the barbarities of the past. We indulge in war, but we no longer make it the chief end of man. Proof that we are progressing is found in the fact that war to-day is considered monstrous instead of legitimate. We exclaim at its injustice, and shudder at its horrors. It is no more a matter of course, no more the usual.

And so we must go one step further. We must not only abhor war among nations, but we must take the war-like spirit from our hearts in dealing with our fellowman. We must suppress resentment, we must do away with retaliation, we must forever control within us the temptation to "get even."



Ontario Dental Society

THE annual convention of Ontario Dental Society will be held April 29th to May 1st, 1919. The Society will be favored in having Progressive Clinics given by Detroit Clinic Club, Dental Educational Association of Toronto, School of Dentistry R.C.D.S., also numerous individual clinics and prominent speakers on dental and other subjects. Mark date in your memorandum. Further announcement later.

DR. J. E. RHIND, *President.*

DR. McKIM, *Chairman Programme Committee.*

DR. J. A. BOTHWELL, *Secretary,*

604 Spadina Ave.

Correspondence

To the Editor, "Oral Health."

Dear Sir,—An article appeared in a recent issue of *Oral Health* criticizing the action of Canadian Headquarters in sending overseas five Assistant Directors of Dental Service with the rank of Captain when they had had senior rank in Canada. I cannot help feeling, Sir, that this was written without a thorough knowledge or consideration of all the facts in connection with the case.

In the first place the ruling of the Headquarters O.M.F.C. is that no officer can come overseas to the Canadian Army Dental Corps higher than the rank of Captain, and we would suppose that when these officers enlisted it was their intention to come overseas, as there have been drafts coming over every few months since June, 1915.

Secondly, it would not be fair to the officers who came overseas as captains to bring officers from Canada and place them in senior positions.

It is a well-known fact that the dental officers who remained in Canada received promotion much more rapidly than those who came over. Many of the captains who came over with the original C.A.D.C. draft are still holding the same rank, and have done faithful and efficient service in France and England for nearly four years, while the others were able to receive promotion—to say nothing of having their homes with easy reach. It would be manifestly unfair to bring overseas officers junior in service, even if senior in rank, to take, as you suggest, charge of dental centres in England over the heads of men who were overseas even before many of these joined the Corps.

I think you will find, Sir, that this opinion is universal among all the officers over here, no matter what draft they came in, and unfairness, if there is any, exists in the fact that so many officers who have come overseas and given their valuable time and professional experience are even now only holding the rank they started out with.

This is not intended in any way to disparage the work or ability of the men you speak of, who are among the best we have, and I feel certain that their present opinion would be that it was the only fair arrangement that could have been made. — Your obedient servant,

OVERSEAS CAPTAIN.

[*The article in question dealt with the subject of rank of Dental officers going overseas, from the standpoint of a comparison between the policies followed by the C.A.M.C. and the C.A.D.C. "Overseas Captain," however, discusses the subject from an entirely different standpoint, namely, that of the relationship existing among officers of the same unit.—Editor.*]

ORAL HEALTH

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No. 4

EDITORIAL

Organization of a Hospital Dental Service

THE administration of a well organized hospital dental service requires that members of the dental profession give freely of their time and skill to this important work. Dental practitioners by cheerful and prompt acceptance of an invitation to assist in hospital work will certainly prove their public spiritedness and love for unselfish service. The true spirit of democracy is manifested by a disposition to assume the *responsibilities* as well as profit by the *rights* of citizenship. Every dentist owes it to himself and to his profession to render a certain amount of free dental service to those who are worthy but cannot afford to pay a fee. Such service is much better rendered in the dental department of a hospital than in the operator's private office. Furthermore, many dentists, because of their office location, receive very few calls from those deserving of free dental service. The hospital is familiar with local social conditions, and is able not only to supply patients but to assure itself of the worthiness of those who apply.

At the very outset, however, it should be clearly understood that the dental service is to be established upon the same basis as the other services in the hospital, and with similar rank. Adequate equipment for both in- and out-patients' work should be installed by the hospital. Funds for this purpose may be secured either by private

donation, public subscription or through regular hospital channels. The personnel of the service will doubtless be named by the hospital board, and should be subject to similar control and regulation as the personnel of other services, and enjoy the privileges of the hospital precisely to the same extent. The head of a hospital service usually has the privilege of nominating the other members of the service. Each member could arrange to attend the hospital at least one afternoon every fortnight. The hospital to collect charges, if any, and provide the necessary dental laboratory service.

As the work develops provision should be made for the appointment of a young graduate as dental interne for whole time service. This would be particularly necessary in all the larger hospitals, and in those situated in the poorer districts of the larger cities. Sufficient nurses to efficiently carry on the work of the service must, of course, be available to the dental department as required.

The general character of the work to be accomplished by a properly conducted hospital dental service might be outlined as follows:

GENERAL CHARACTER OF SERVICE.

Erect and maintain proper standards of oral cleanliness as a routine hospital procedure. By instruction to both nurse and patient, have intelligent oral cleanliness practised throughout the entire hospital.

OUT-PATIENT DEPARTMENT.

Conduct a dental surgery for the worthy poor, and treat all emergency cases.

IN-PATIENT DEPARTMENT.

Examination and dental history of public-ward patients and all necessary treatments to be carried on in co-operation with the attending physician or surgeon. Special effort to be made to locate and treat septic conditions about the oral cavity.

PRIVATE PATIENTS.

Maintain the same hygienic standards in the private patients' department, but undertake treatment only upon request.

* * * * *

There are many other details that might be discussed, but the foregoing would appear to the writer to be a general outline of the character of the service to be rendered by the dentist in the hospital.

The hospital dental service is sure to come. Are you ready? Be prepared, and when the opportunity presents, be thankful that you have the privilege of rendering the splendid social service that is possible through the medium of the modern hospital.

“La Restauration Maxillo-Faciale”

PRIOR to November, 1918, the literature which describes the remarkable work carried on largely in France in dento-facial reconstruction of wounded soldiers, had been available only to a small proportion of the English-speaking members of the dental

profession, because of the entire use of the French language in these publications. With characteristic generous desire on the part of our French confreres, that the necessary knowledge which will be very shortly essential for the civilian dentist in the treatment of his returned soldier patients should reach all, the official monthly magazine covering this field, *La Restauration Maxillo-Faciale*, has included in its pages, beginning November, 1918, an English translation of the matter contained therein.

Major Cummer is one of those who has enjoyed the privilege of access to the pages of *La Restauration Maxillo-Faciale* since its beginning in April, 1917, and feels no hesitation in stating that the literature and the report of the proceedings of the Congress Dentaire Interallies have been absolutely essential to him in his participation in the reconstruction work as at present carried on by the Canadian Army Dental Corps.

Civilian dental practitioners must realize that returned soldier patients will look to them for a highly specialized service, and those who intend to meet this demand will find no better opportunity for acquiring this special knowledge than to subscribe for, and carefully read, the pages of *La Restauration Maxillo-Faciale*.

Five hundred English-speaking subscribers are required in order that our French colleagues may be enabled to meet the expense of these translations.

The charge is three dollars and a half per annum, and may be sent either through the local supply houses, or direct to the Editor, 108 Boulevard Saint-Germain, Paris, France. The readers of Oral Health are urged to make generous response to this appeal.

Northern Ohio Dental Association

THE Northern Ohio Dental Association will meet in Cleveland, Ohio, June 2nd, 3rd, and 4th, at Hotel Statler. A post graduate course will be held from the 2nd to 6th inclusive, consisting of the following:

Nerve Blocking Anaesthesia: Dr. Arthur E. Smith of Chicago.

Attachments to Vital Teeth: Dr. Edward T. Tinker of Minneapolis.

Prosthesis: Dr. M. M. House of Indianapolis.

GEORGE B. SMITH, *Secretary*.

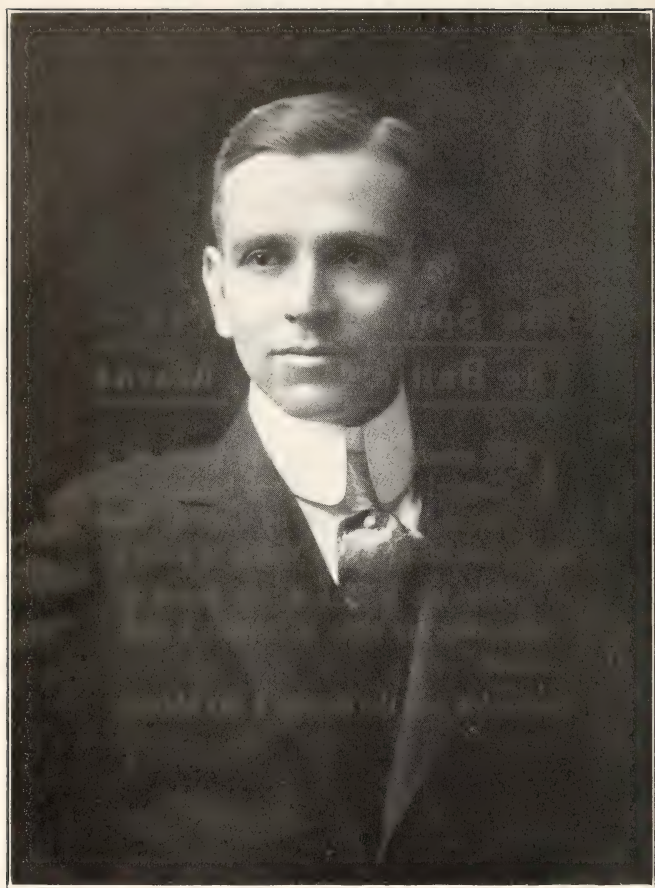
FLASKING.—Before pouring the plaster of Paris into the flask to form the mould, thoroughly dust the inside of the flask with French chalk to prevent the plaster sticking to it. The vulcanized case can then be quite easily removed without bruising the flask.—K.

The Spirit That Won —
The Battle Of the Marne

THE greatest message ever sent by a General from a field of battle is the fifteen words sent by General Foch on the battlefield of the Marne, to Joffre :

“My left is shaken, my centre is retreating, my right is routed; I shall attack.”

That spirit won the Battle of the Marne.



JOHN E. RHIND, D.D.S.,
Toronto
President, Ontario Dental Society

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, MAY, 1919

No. 5

President's Address

J. E. RHIND, D.D.S., TORONTO.

To the Members of the Ontario Dental Society:

THE last three Ontario Dental Conventions were held with the shadow of a great war resting darkly over us. How grateful we should be that our Armies and those of our Allies have triumphed, and let us hope that the Peace Treaty soon to be signed will prevent forever the recurrence of such a terrible catastrophe. The members of the Dental profession serving in the Canadian Army Dental Corps did much to fit men for active service, and will now be called upon to help make them fit to resume their duties as citizens in peace-times. Through their services the importance of oral health has been impressed upon thousands of young men in such a practical way that it will never be forgotten.

The Convention of 1918 decided that the Constitution and By-Laws of this Society should be revised and brought up-to-date. The Committee appointed then have spent much time and thought upon the matter, and will present a report for your consideration.

The Constitution and By-Laws of the Canadian Dental Association have been re-drafted within the past year. Provision has been made for representation from this Society on the Executive Council of that organization, and I hope that advantage of that privilege will be taken by electing certain members to represent the Ontario Dental Society.

For some time past negotiations have been going on, tending towards the taking over by the University of Toronto of the Teaching of Dentistry as one of the University faculties. It appears that this would have many advantages if it could be arranged on a satisfac-

tory basis. It would be well for the members of the profession to give this subject their serious thought, discuss it with their representative on the Board, read the Minutes of the Board which are sent to them each year, and so be prepared to deal intelligently with this important matter at the proper time.

The subject of trained help for the dentist is one that might be considered and suggestions offered by this Society. In conversation with Dean Webster I have learned that the College has under consideration "An Assistant's Course" which would provide training in Secretarial Work, Record-Keeping, Sterilizing, etc. This should meet one particular need at least. But what of the "Woman Dental Hygienist," who has been recognized by statute in a number of the States in the neighboring Republic? Her sphere of work is pretty much limited to prophylaxis under a dentist's supervision, and the instruction of mothers and children as to the importance of a healthy mouth. Is the dentist shirking his responsibility in handing over these important duties to a non-graduate, and will it not be difficult to restrict the sort of operations which may be performed, Many good ideas have come to us from the United States, but I think we should be slow to adopt this one.

The Department of Education of the Province of Ontario has decided to appoint a Dental Inspector. His duties at first will largely consist in arousing an interest in dental inspection throughout the Province and in helping to organize local clinics. This is the most progressive step in dental legislation which has ever been made in this province, and the report of the Oral Hygiene Committee will deal more fully with it.

Report of O.D.S. Annual Convention

THE fifty-second annual meeting of the Ontario Dental Society was held at the Central Y.M.C.A. Building, Toronto, April 28th-May 1st, 1919. The convention this year took the form of progressive clinics, with the single exception of an excellent paper by Dr. Percy Howe, of Boston, which was presented upon the afternoon of the first day.

The progressive clinics were an unqualified success, and were given by the Detroit Clinic Club, the Hamilton Clinic Club, and two progressive clinics given by members of the Graduating Class of the Royal College of Dental Surgeons. One of the latter, illustrating Root Canal Technique, was organized by Dr. A. E. Webster, and the other, showing Crowns and Steps in Technique, was organized by Dr. I. H. Ante. The clinician-students, the graduates, and those in charge of the clinics, are to be congratulated upon the splendid demonstrations that were given. The Detroit Club Clinic was a great suc-

cess, and covered Prosthodontia, including Impressions, Study Models, Individual Impression Trays, Test Impression (both upper and lower), Working Models, Bite, Selection of Teeth and Their Arrangement, Flasking, Packing, Carving and Finishing. The Hamilton Club clinic was also a great success, and took up Prosthodontia work, illustrating particularly the Hall Method of Denture Making.

Dr. W. B. Amy was Supervisor of Clinics, and is to be congratulated upon the arrangements and administration of the clinic programme. Dr. McKim, Chairman of the Programme Committee, the President, Secretary and other officers, have every reason to be proud of the very practical and satisfactory results of the Convention this year. Dr. J. A. Bothwell proved himself indefatigable in the interests of the Convention.

The clinicians were as follows:

Detroit Clinic Club.—Doctors Wm. A. Giffen, F. W. Holt, V. B. Rea, Wm. Matheson, Lloyd Rogers, Chas. Lane, P. C. Lowery, Elmer L. Whitman, W. H. Waller, and A. Deyoe.

Dr. Giffen read a short paper drawing particular attention to certain phases of prosthodontia work.

Hamilton Clinic Club.—Doctors J. E. Johnston, J. A. Locheed, S. Clappison, H. M. Morrow, F. P. Moore, F. J. Furlong, H. A. Robertson, F. L. Williamson, J. N. Stewart, D. J. Weadick, and D. T. Main.

Dr. Hall read a short paper and gave a clinic on the Articulator, and also showed cases from practice.

Operative Clinic.—In charge of Doctors A. E. Webster and Frank Price.

Student-Clinicians.—Messrs. Richardson, Hugill, Godwin, Sawyer, Johnson, Taylor, Brownlee, Ross, Giffin, Lapp and Clairmont.

Crown and Bridge Clinic.—In charge of Dr. I. H. Ante.

Student-Clinicians.—Messrs. G. L. Shannon, H. W. Hogg, G. V. Gardiner, R. I. Hotham, M. C. G. Bebbie, M. H. Blandin, S. A. Moore and A. Couture.

Two luncheons were held during the Convention, and these were addressed by Rev. A. Logan Geggie and Sir John A. Willison.

The Exhibits were an important feature of the Convention, and attracted widespread interest among the members.

Report of Oral Hygiene Committee O.D.S.

AT the last annual meeting of The Ontario Dental Society the following were elected on the executive of the Oral Hygiene Committee: Doctors H. E. Eaton, J. A. Bothwell, F. C. Husband, J. J. Conboy, N. S. Coyne, and A. W. Ellis. These, together with the past Chairmen, Wallace Seccombe, C. W. Trotter, R. G.

McLaughlin, and R. J. Reade, and the Chairman of the sub-committees, form the executive of the Ontario Oral Hygiene Committee. The Committee at its first meeting elected the following officers for the year 1918-19: Dr. R. J. Reade, Chairman; Dr. H. E. Eaton, Vice-Chairman; Dr. N. S. Coyne, Secretary; Dr. A. W. Ellis, Treasurer.

During the year just past the work carried on by your committee has been varied. As in the past, the sub-committees were asked to address the teachers at the Fall conventions held throughout the Province. When the local dentist, for reasons which seemed sufficient to himself, did not care to appear on the programme of the conventions, your Executive supplied lecturers as far as possible. This is a work of much importance, and prepares the school teachers for the reforms and advances that are to be made regarding the means of supervising the health of the school population.

Your President asked the chairman of the Oral Hygiene Committee to attend a meeting of the Preparedness League of Dentists in Buffalo, and to report to him what was the outline of the work to be pursued by the League. The occasion of the request was that Dr. J. W. Beach, the President, on a visit to Toronto, desired a joint meeting of the dentists of Canada and the dentists of the League, to ascertain if there was a possibility of a co-operation in our efforts for the uplift of humanity. The Preparedness League was a war measure. The war having ceased, the executive of the League were loath to allow the splendid machinery which they had constructed to fall into disuse. The impression of the meeting was that if any attempt at co-operation was to result, it would be necessary for the League through the National Dental Association to approach the Canadian Dental Association.

During the year your committee appointed a sub-committee to work with the Military Dental Clinic here. Plans were drawn for a Military Dental Hospital. The victory of the Allies, and the signing of the Armistice, was the signal for a halt in all such work.

The question of a Dental Clinic at the Gravenhurst Hospital was taken up and worked out pretty thoroughly. Equipment was already being installed, and the management had operators in view.

Mr. Putman, of the Agricultural Department of the Provincial Government, asked for the co-operation of the Committee to make an investigation of the school children of Streetsville, and put on a clinic for two days. The Committee complied with the request and Dr. Bethwell kindly took charge of this work.

The fact of the Women's Institutes taking up this work is significant.

Your Committee had learned that if any progress was to be made in introducing Dental Inspection as a Government measure it would be necessary to supply the different members of the House with the

facts relating to the condition of the teeth of the children of the Province. With this end in view, a letter and a leaflet was prepared and sent to every member of the Ontario Government.

During the year your Committee has had several interviews with the Hon. Dr. Cody, Minister of Education, with a view to introducing Dental Inspection and Dental Clinics in the schools of the Province. Dr. Cody seems to grasp the situation and is sympathetic with the effort. Very gratifying progress has been made in the matter of Provincial Dental Inspection. The matter has gone so far that we hope that a Dental Inspector will be appointed within a few weeks. In fact, if this Convention had been held just a little later, we would have been able to give you the name of the Inspector.

These are some of the results of the efforts of your Committee during the past year. But the results are not of this year's work alone. The end attained has been achieved by the constant effort of your Executive and sub-committees, during the past nine years your Oral Hygiene Committee has been in existence.

Early in the season your committee mailed to every dentist in the Province a circular letter, giving a series of suggestions on the best method of placing forcibly before the local authorities the necessity of having a system of dental inspection introduced into the schools of any particular city, town or locality. This circular was especially intended to be of assistance to any local committee or individual dentist who was endeavoring to work out the problem of dental inspection in his own town. We believe the propaganda outlined in this circular proved of practical value to many in the profession.

All of which, together with the subjoined Treasurer's report, is respectfully submitted.

N. S. COYNE,
Secretary.

ROBERT J. READE,
Chairman.

Resume of Dr. Percy Howe's Paper

A. D. A. MASON, D.D.S., TORONTO.

DR. HOWE'S paper, presented to The Ontario Dental Society, was most instructive, and the fact that the essayist's statements were so emphatic, and that he was quite positive in his conclusions, made his paper very refreshing.

Speaking of dental pulp; from clinical observation it is a known fact that the dental pulp has restorative properties, shown in the fact that fractures in children's teeth have thrown out calcific salts and restored the union between the two fragments of the tooth. Owing to the fact that the pulp possesses this restorative property, Dr. Howe is emphatic in his conclusion that the dental pulp should be saved, even

to the extent of capping fairly large exposures.

The method of capping proposed by Dr. Howe is to use oxide of zinc and eugenol for the layer immediately over the pulp, this to be followed by a deposit of silver from the Howe method of using silver nitrate.

In cases of putrescent pulp, the method of treatment advocated by Dr. Howe was as follows: Prepare a solution of silver nitrate—3 drams of silver nitrate to 1 c.c. of water. To this solution add $2\frac{1}{2}$ c.c. of strong ammonia, and filter the solution to get rid of the precipitate. Then place in a dark colored bottle, away from the sunlight. This is known as Solution A. Solution B is a 25 per cent. solution of formalin. Treatment: To the putrescent canal add Solution A, leaving it for about three minutes; then follow with Solution B, which is also left for about three minutes. Now wipe the solution out of the canal, and repeat this method until the canal has been thoroughly sterilized. The canal can then be filled by any method the operator desires, but Dr. Howe does not believe that any other root canal filling is essential.

In the use of Solution A one must be careful not to pump the solution through the end of the apical foramen, as such treatment is very irritating to the vital tissue. Capillary attraction is all that is necessary to get this solution to reach the end of the root, and the solution will enter all tubuli in which there is any infection. It will not enter tubuli in which there is vital tissue, owing to the coagulating properties of the silver nitrate.

The great objection to this method of root canal treatment is the discoloration of the tooth tissue. To protect the crown of the tooth from discoloration, Dr. Howe recommends the use of wax, or a rosin solution.

The Howe method is recommended only for treatment of the root canal, not for the tissue beyond the root canal. For tissue beyond the root canal Dakin's Solution or Churchill's Tincture of Iodine are recommended.

A solution of iodide of potassium is the agent used to remove any stains caused by the silver nitrate.

Those Who Attended the O.D.S. Meeting

The following is a list of those in attendance at the Convention:

Dr. Abbott, C. N., London.

" Adams, J. F., Toronto.

" Allen, A. H., Peterboro.

" Allen, G. P., Mount Forest.

" Amos, J. E., Brantford.

" Amy, W. B. T., Toronto.

" Anderson, H. W., Toronto.

" Anderson, J. L., Oakville.

Dr. Ante, I. H., Toronto.

" Armstrong, H. H., Toronto.

" Armstrong, J. W., Toronto.

" Armstrong, M. T., Parry Sound.

" Armstrong, W. A., Ottawa.

" Arnold, E. F., Toronto.

" Arnott, H. C., Toronto.

" Ault, J. W., Prescott.

Dr. Bald, G. W., Sault Ste. Marie.
 " Ball, E. S., Toronto.
 " Ball, W. H. W., Toronto.
 " Bansley, J. C., Toronto.
 " Barron, F., Paris.
 " Barbour, (Capt.) F. W., Base Hospital, M.D. No. 2.
 " Barker, E. S., Stouffville.
 " Beaton, D. H., Toronto.
 " Beatty, J. A., Stratford.
 " Belden, G. F., Toronto.
 " Berry, R. N., Caledonia.
 " Billings, M. R., Cayuga.
 " Black, D. A., Toronto.
 " Black, W. A., Toronto.
 " Bagshaw, D. J., Toronto.
 " Bothwell, J. A., Toronto.
 " Bothwell, J. A., Stratford.
 " Bracken, D. M., Grand Valley.
 " Bradley, S. W., Ottawa.
 " Brooks, C. E., Toronto.
 " Broughton, A. J., Toronto.
 " Brown, A. J., Mitchell.
 " Brown, J. J., Woodstock.
 " Brownlee, W. A., Grimsby.
 " Bruce, E. E., Kincardine.
 " Burnett, A. C., Hamilton.
 " Burnet, W., Galt.
 " Butler, T. E. C., Toronto.

Dr. Cameron, (Maj.) G. L., Toronto.
 " Campbell, G. H., Orangeville.
 " Campbell, E. T., Toronto.
 " Campbell, L. G., Markdale.
 " Campbell, P. W., Toronto.
 " Campbell, T. F., Galt.
 " Campbell, A. G., Wallaceburg.
 " Capon, F. J., Toronto.
 " Chalmers, W. L., Toronto.
 " Chambers, J. S., Toronto.
 " Chambers, R. M., Leamington.
 " Chapin, C. G., Toronto.
 " Cheney, H. L., Alexandria.
 " Clappison, O. S., Hamilton.
 " Clark, H., Toronto.
 " Clarke, M. J., Belleville.
 " Clarkson, C. H., Toronto.
 " Coupland, P. T., St. Marys.
 " Collard, C. R., Toronto.
 " Cosgrove, R. H., Ottawa.
 " Conboy, F. J., Toronto.
 " Coon, W. H., Toronto.
 " Cowan, W. A., Toronto.
 " Craig, J. J., Peterboro.
 " Crane, H. O. C., Toronto.
 " Crawford, J. C., Haileybury.
 " Crocker, H. D., Tillsonburg.
 " Crozier, A. L., Sault Ste. Marie.
 " Crippen, D., Toronto.
 " Cunningham, H., Toronto.
 " Currie, T. A., Toronto.

Dr. Dalrymple, W.A., Toronto.
 " Davidson, D., Woodstock.
 " Day, M.A., Belleville.
 " Day, P. L., Harrowsmith.
 " Dayment, F. L., Toronto.
 " Dawson, T. W., Toronto.
 " Day, A., Toronto.
 " Devitt, J. C., Bowmanville.
 " Dickson, R. O., Toronto.
 " Dolson, E. A., Toronto.
 " Doering, L., Mildmay.
 " Douglas, N. K., Owen Sound.
 " Drummond, J. A., Petrolea.
 " Duff, J. H., Toronto.

Dr. Eaton, H. E., Toronto.
 " Eckel, S., Waterloo.
 " Edwards, A. J., Toronto.
 " Ellis, A. W., Toronto.
 " Emmett, G., Toronto.
 " Everett, G. W., Toronto.

Dr. Falconer, E. W., Sarnia.
 " Fallis, C. O., Toronto.
 " Fear, W. J., Ayimer.
 " Fisher, R. E., Toronto.
 " Fleming, J. A., Prescott.
 " Fleming, W. A., Alliston.
 " Floyd, S. T., Toronto.
 " Follick, L. L., St. Marys.
 " Frain, J. H., Norwich.
 " Fraser, G., Madoc.
 " Frawley, S. L., Toronto.
 " French, H. G., Dresden.
 " Fuller, E. W., London.
 " Fuller, W. J., New Liskeard.
 " Fulton, E. M., Hamilton.
 " Furlong, F. J., Hamilton.

Dr. Giffen, Wm. A., Detroit.
 " Gausby, E. L., Toronto.
 " Gibson, G. F., Campbellford.
 " Girvin, Capt., Ottawa.
 " Gow, G., Toronto.
 " Grant, J. F., Durham.
 " Gray, J. W., Hamilton.

Dr. Hagey, M. H., Preston.
 " Hall, R. E., Chicago.
 " Halloran, H. H., Toronto.
 " Hamilton, R. S., Brussels.
 " Hand, J. R., Ottawa.
 " Hansel, F., Hamilton.
 " Hardie, E. S., Hensall.
 " Harvie, R. R., Midland.
 " Hart, E., Brantford.
 " Hartman, H. N., Meaford.
 " Hassard, O. G., Windsor.
 " Henderson, R. H., Toronto.
 " Higley, E. A., Chatham.
 " Heath, V. LeR., Woodstock.
 " Hendry, F. G., Delhi.
 " Hill, E. A., Sudbury.
 " Hill, W. J., Alliston.

- Dr. Hoffman, R. W., Toronto.
 " Holmes, G. H., Owen Sound.
 " Howden, G. N., Watford.
 " Husband, F. C., Toronto.
 " Husband, R. J., Burlington.
 " Hutchison, J., London.
 " Hicks, A. A., Chatham.
 " Hilliard, J. A., Kitchener.
- Dr. Ionson, S. S., Pt. Rowan.
 " Irvine, H., Lindsay.
- Dr. James, H. B., Oshawa.
 " Jarman, F. S., Bancroft.
 " Jemison, A., Millbrook.
 " Jones, F. H., Toronto.
 " Johnston, A., Petrolea.
 " Johnston, J. E., Hamilton.
 " Jordan, G. G., Toronto.
- Dr. Kennedy, C. A., Toronto.
 " Kennedy, G. T., St. Thomas.
 " Kennedy, L. T., Toronto.
 " Kerr, A. C., Sault Ste. Marie.
 " Kinsman, A. R., Exeter.
 " Knapp, A. E., Kingston.
 " Koepfel, L. A., Kitchener.
 " Kalbfleisch, H. M., Toronto.
- Dr. Law, F. G., Toronto.
 " Leacy, J. J., Ottawa.
 " Lederman, S., Kitchener.
 " Lee, G. A., Whitby.
 " Locheed, J. A., Hamilton.
 " Lumley, C. C., St. Thomas.
 " Lundy, W. E., Toronto.
 " Linscott, B. W., Brantford.
 " Laidlaw, M. L., Toronto.
 " Lowery, Toronto.
- Dr. Main, D. T., Buffalo.
 " Mabee, A. H., Gananoque.
 " Mabee, L. M., Goderich.
 " Manning, W. G., Hamilton.
 " Marshall, V. C. W., Owen Sound.
 " Martin, G. S., Sudbury.
 " Mason, A. D., Toronto.
 " Mathieson, W. A., Toronto.
 " Middleton, J. E., Peterboro.
 " Mills, G. K., Tilbury.
 " Montgomery, R. J. M., Toronto.
 " Morrow, H. M., Hamilton.
 " Merkeley, H. J., Winnipeg.
 " Moore, F. P., Hamilton.
 " Moore, J. C., Orillia.
 " Morgan, W. E., North Bay.
 " Morton, G. V., Toronto.
 " Morrison, M. A., Peterboro.
 " Muir, A. W., Fergus.
 " Macfarlane, R., Kitchener.
 " MacLachlan, J. P., Toronto.
 " MacLaren, W. A., Toronto.
 " McClean, H. A., Milton.
 " McLean, R. G., Toronto.
 " McCullough, J. H., Perth.
- Dr. McGahey, R. J., Toronto.
 " McGill, T. N., Toronto.
 " McGorman, W. T., Port Arthur.
 " McKay, H. J., Hamilton.
 " McKay, W. S., Galt.
 " McKim, H. A., Toronto.
 " McKinley, G. C., Toronto.
 " McKnight, R., Sudbury.
 " McLaughlin, R. G., Toronto.
 " Macartney, W. C., Ottawa.
 " MacDonald, H. G., Goderich.
 " McVey, K. M., Toronto.
- Dr. Neelands, J., Lindsay.
 " Nethercott, D. R., Stratford.
 " Nott, B. F., North Bay.
- Dr. O'Flynn, J. F., St. Catharines.
- Dr. Peaker, E. A., Toronto.
 " Palmer, G. L., Toronto.
 " Pearson, C. E., Toronto.
 " Phillips, G. C., Toronto.
 " Plaxton, O. G., Toronto.
 " Price, F. D., Toronto.
 " Price, W. J., Orangeville.
 " Proudfoot, P. B., Russell.
- Dr. Reath, F. E., St. Thomas.
 " Rickard, H. B., Port Colborne.
 " Riggs, L. F., Toronto.
 " Rhind, J. E., Toronto.
 " Robertson, H. A., Hamilton.
 " Rutherford, M. W., Toronto.
 " Robertson, A. R., Ayr.
 " Ross, J. F., Toronto.
 " Ross, C. M., Hamilton.
 " Ross, R. R., Seaforth.
 " Roulston, G. F., Exeter.
 " Russell, D. E., Brantford.
- Dr. Sanderson, H. M., Toronto.
 " Savage, L. V., St. Thomas.
 " Scott, H., Hamilton.
 " Scott, C. G., Toronto.
 " Seccombe, W., Toronto.
 " Sebben, J. F., Stratford.
 " Sellery, F. A., Toronto.
 " Shantz, U. B., Kitchener.
 " Stewart, R. E., Elmira.
 " Strathern, P. A., Kingston.
 " Sudworth, W. A., Ingersoll.
 " Smith, W. C., Toronto.
 " Sutherland, G. M., Toronto.
 " Sutton, C. E., Toronto.
 " Shaw, (Lt.-Col.), F. P., London.
 " Simpson, J. F., Trenton.
 " Simpson, S. H., Kingston.
 " Slade, J. A., Toronto.
 " Stowe, F. J., Toronto.
 " Smith, A. A., Toronto.
 " Smith, D. C., Stouffville.
 " Smith, L. G., Toronto.
 " Smith, N., Chatham.
 " Smith, P. St. C., Toronto.

Dr. Snell, C. A., Toronto.
 " Somerville, W. R., Haileybury.
 " Sparks, E. B., Kingston.
 " Smith, C. J., London.
 " Spence, W. G., Listowel.
 " Sprott, R. J., Barrie.
 " Staples, W. D., Hanover.
 " Stewart, J. N., Hamilton.

Dr. Thompson, Col. W., Hamilton.
 " Thomson, A. S., Toronto.
 " Thornton, R. D., Toronto.
 " Trewin, G. M., Oshawa.
 " Thompson, (Capt.) Harry, Toronto.
 " Thomas, S. M., London.
 " Thomas, M. A. R., London.
 " Terry, C. A., Queensville.
 " Temple, B., Toronto.
 " Taylor, C. B., St. Thomas.
 " Trotter, W. C., Toronto.
 " Topp, J. W. B., Bracebridge.
 " Tindale, M. C., Hamilton.

Dr. Vance, R. J., Waterdown.

" Veitch, E. C., Toronto.

Dr. Wagg, A. B., Toronto.

" Walker, H. B., Toronto.

Dr. Walker, W. L., Toronto.

" Wallace, R. D., Toronto.

" Walsh, J. L., Kingston.

" Walt, C. F., Kingston.

" Watson, F. R., Georgetown.

" Watson, P. J., Toronto.

" Waugh, F., Kingston.

" Webster, A. E., Toronto.

" Weadick, D. J., Hamilton.

" Weldon, A. M., Peterboro.

" Williamson, F. L., Hamilton.

" Wilkinson, H. G., St. Marys.

" Wilkinson, H. N., Newmarket.

" Watson, D., Brantford.

" Wickett, W. C., Toronto.

" Will, J. R., Brantford.

" Willard, W. T., Toronto.

" Willmott, W. E., Toronto.

" Wilson, J. J., Burks Falls.

" Wilson, S. C., Perth.

" Winters, H., Oshawa.

" Woods, W. J., Toronto.

" Wray, W. E., Toronto.

" Wright, F. J., Toronto.

" Wylie, T. H., Toronto.

Dr. Zeigler, O. H., Toronto.

O.D.S. to Seek Incorporation

IT was decided at the annual meeting of the Ontario Dental Society that the Society seek incorporation. Officers and committees were elected as follows:

Honorary President—Dr. J. E. Rhind, Toronto.

President—Dr. Jos. A. Bothwell, Stratford.

Vice-President—Dr. J. A. Fleming, Prescott.

Secretary-Treasurer—Dr. John A. Bothwell, Toronto.

Archivist—Dr. C. A. Kennedy.

BOARD OF GOVERNORS (PROGRAMME COMMITTEE.)

For one year—Drs. MacLachlan and Gausby.

For two years—Drs. Brooks and McKim.

For three years—Drs. Conboy and Plaxton.

ADVISORY COMMITTEE.

Dr. R. G. McLaughlin.

Dr. Wallace Seccombe.

Dr. A. D. A. Mason.

Dr. Harold Clark.

Dr. T. H. Wylie.

ORAL HYGIENE COMMITTEE.

Dr. A. Ellis.

Dr. F. C. Husband.

Dr. F. J. Conboy.

Dr. H. E. Eaton.

Dr. J. P. MacLachlan.

Report of Advisory Committee in Cases of Alleged Malpractice

THIS Committee of the O.D.S. is composed of Doctors F. J. Conboy, A. E. Webster, Wallace Seccombe, A. D. A. Mason, and R. G. McLaughlin.

The Committee has now been in existence for two years, and is acting in an advisory capacity to those of the dental profession who are threatened with legal proceedings because of alleged malpractice, and who seek its advice. During this term the committee has been able to render assistance in a number of important cases, and through its advice and the guidance of legal counsel is glad to report that all cases so far coming before it have, it is believed, been brought to a just conclusion.

As all such cases are treated confidentially by the committee, a list cannot properly be placed before the Society. However, from the two years' experience, the members feel that there is a real need in the profession for the services of such a committee.

Respectfully submitted.

R. G. McLAUGHLIN, Chairman.

Financial Statement—Oral Hygiene Committee, Ontario Dental Society

April 1st, 1918, to May 1st, 1919.

RECEIPTS.

Balance	\$ 53.82
Grant, Ontario Dental Society	300.00
Bank Interest .....	.52
	<hr/>
	\$354.34

DISBURSEMENTS.

Printing, Postage, Reports, Circulars, etc.	\$182.61
Lecturers' expenses to Teachers' Conventions ...	41.15
Committee Expenses	37.20
	<hr/>
Total	\$260.96
Balance	93.38
	<hr/>
	\$354.34

ARTHUR W. ELLIS, Treasurer.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

SOME PROBLEMS IN DENTAL EDUCATION.

NO matter how intense the feeling of apathy may be, one can always arouse interest and not infrequently ire, by introducing the subject of dental education. If any attempt at classification were to be made, it might be to divide the profession into two schools: the moderate and the extremist; or the theoretical and the practical. As the editor of "The British Journal of Dental Science"* expresses it:—"Between the theorist who would attempt the Herculean task of converting a callow youth into a creature almost omniscient on matters medical, surgical, and dental, and the practical person, at times a trifle myopic, who would educate the hands and let the book work be reduced to a minimum, the gulf is wide and seems almost incapable of being bridged." This statement represents the English viewpoint, perhaps, rather than that of American dentistry and arises no doubt from the effort to "line up" the teaching of dentistry more intimately with that of general surgery or medicine. To show that there is some reason for accepting this view, we quote again from an earlier editorial in the British Journal†:—"The Board of Education has published a Memorandum by Sir George Newman, K.C.B., which deals with the methods and teaching of the subjects included in the medical curriculum. It is one of the most lucid and courageous criticisms ever launched by a conspicuously able man and reveals the virtues and the shortcomings of our present system of teaching. Unfortunately dentistry is not taken within the purview of the Memorandum, although since many dentists also take medical degrees or diplomas the criticisms affect such men. . . . The pamphlet commences by considering the general practitioner. It inquires what are his duties and how far do modern methods equip him to carry out those duties. Comparing schools and syllabuses we learn that a great diversity exists between these. In some cases the students are well taught, in some slipshod and cram replace practical

*April 1, 1919

†December, 1919

and thorough systems. If we compare the education of all dentists in subjects which are not technical to their future career, we find it is far from the ideal. Just as the medical student's mind is overloaded and confused by the multiplicity of the subjects scheduled for him, so is the dental student overtaxed by matters which in his case are useless to him and therefore are merely crammed for examinational purposes. If it could be proved that doubly qualified men proceeding to the L.D.S. adopted as a specialty are better dentists, no valid reason could be advanced against our methods. As a matter of fact no such proof is forthcoming, nor can a man holding medical qualifications be reckoned the superior in knowledge when five or ten years of dental practice have allowed his smattering of general subjects to pass out of his mind through disuse."

The men who represent what may be termed the "practical" school of thought would wipe out the present curriculum and rearrange the studies on the basis of what a dental student will have to do when he is in full practice, allotting to him only those phases of medical study that represent the junction between his professional problems as a dentist and those of the medical practitioner. On account of the difficulty attending any attempt to say just where dentistry stops and medicine begins, the extremists amongst us would have the dentist take the full training in medicine and surgery also. Such a double course represents more time and expense. It gives him little, if any, prestige in dentistry, and there is always the danger of muddling the two careers. To quote again from the editorial referred to above:—"They court medicine and surgery as wanton jades whom they propose to jilt when the 'final exam.' is passed, while they intend to wed for the period of their lives the maid whom men call dentistry."

These views serve to illustrate the feeling of unrest as it prevails in England regarding the future of dentistry in that country. No doubt the outcome will be some sort of an educational system that will give the community many "good" practical dentists and not just a select few "super" dentists with a string of letters attached to their names.

In America the study of dentistry has progressed as a separate profession. Many would have dentistry taught as a sub-department of medicine and surgery, hoping thereby to better the profession. A survey of conditions in England ought to show them the folly of any such course. Co-operation by both professions is the secret of success. Recently the period of training for dentists in the United States was increased from three to four years, and some new subjects were added to the curriculum of studies. We are told that this addition of time has resulted in a decreased attendance at the dental colleges. This must mean that in the very near future there will be a marked

insufficiency of dental operators to meet the urgent public needs. As the editor of "The Dental Register"* expresses it:—"Under present conditions the attendance in dental colleges is surely decreasing and the public demand for dental service is rapidly increasing, and it is difficult to foretell what the result may be. It is almost certain that we are, in the near future, to see some unexpected developments in our profession, consequent of the prevalent tendency to overthrow the present order and enthrone the idealist."

In addition to the extended dental course, at least one state (New York) will require special preparation for students entering the dental course. Such subjects as English, Physics, Biology, and Chemistry, are made compulsory. Granted that a knowledge of these subjects is excellent; but how are students to get training in them when only about half of the best high schools teach these subjects fully?

In order to show how wide-spread the interest in the question of dental education is, we quote again, this time from "The International Journal of Orthodontia."† The editor says in part:—"We have always advocated raising the dental profession by means of better education, but under the present plans that have been adopted there is a serious thing to be considered regarding the final outcome. The question is whether the lengthening of the dental college course and the raising of the preliminary requirements is going to raise the standards of the profession and produce a dental profession that is better able to serve the public than the dental profession has done in the past. In regard to dental and medical education a few men have questioned the wisdom of a long preliminary education as a requirement to the study of medicine and dentistry and then long years of special training. The question has been asked whether it would not be better to devote the time to dental education, thereby giving instruction only in those subjects which will make a student a better professional man, and not spend a number of years with high school and college subjects that have no particular bearing on dental or medical education. By careful study and analysis of the curriculum of the four year dental course it will be seen that very little more time is given to the study of dental subjects in four years than was given to those same subjects in three years. In other words, would it not be better to give more intensified training on dental subjects during three years than to lengthen the course to four years, thereby causing the man to enter his professional life a year later?"

To the super-men of our profession we owe a great deal. To the average good practitioner the public look because it is to him they go for service; the specialist is beyond their means. Take for in-

*March, 1919

†April, 1919

stance the specialist in prosthetics. He may make wonderful dentures and his fee of four or five hundred dollars appear quite reasonable to his select patient. But this specialist cannot attempt to meet the needs of the man of moderate means. Both patients—the rich and poor—are in need of service and must be attended to. Would it not be better to graduate ten students, each able to prepare five good serviceable dentures a week, at a moderate fee, than one student who is capable of making one five-hundred-dollar denture per week? The super-dentist satisfies the needs of one person only, whilst the good average dentist is taking care of at least five times that number. Service to the public which, after all, is the real purpose of any profession, may be measured, in dental terms at least, by the number of patients a dentist can take care of satisfactorily. If we make the preliminary and college training too exacting we shall undoubtedly lessen the number of graduates and so reduce the amount of service to the public.

From time to time we hear criticisms of the teaching staffs of our dental colleges. The chief fault is found in the fact that most of the teachers are “part-time” men:—That is, they conduct a private practice in addition to acting as instructors at the school of dentistry. Many claim that such a dual position tends to lessen their effectiveness as teachers. Aside from the economic phase of the controversy, it can be claimed in favor of this arrangement that a teacher who is in active professional practice is brought face to face with many practical problems of interest to the students—problems that most likely would escape the attention of one solely engaged in academic pursuits. The objection commonly raised against such a plan is that the teacher is apt to keep an eye on the clock because he knows that a patient awaits him at his office. Full-time service would do away with this objection.

The selection of teachers is a difficult task. Teaching is an acquired art. A man is not necessarily a good teacher because of his many diplomas. A good teacher will regard it as his duty to keep in touch with the very latest approved methods of teaching and not depend too much upon a mere text-book exposition. The teacher's personality counts for as much, perhaps sometimes more, than his scholastic attainments. One who is known to indulge in any form of dissipation is bound to have an ill influence upon those whom he teaches. The training of the handicraft side of dentistry is necessary in our teaching but if we can get a man of forceful character—a man with much driving power in his personality, then we shall have accomplished a two-fold object, *i.e.*, the development of dentists as well as good citizens.

The various views of the writers quoted above are presented in this column, not because of entire agreement therewith, but solely for the

purpose of placing before our readers the opinions held by some of our co-workers regarding this important subject.

STEREOSCOPIC ROENTGENOLOGY.

But a short time ago the question asked of one dentist when he met another was:—"Are you doing any X-ray work?" Now the common inquiry is:—"What machine are you using?" The utility of this department of dentistry is placed beyond doubt. All of us are ready to pay tribute to its great usefulness in the effort to do better dentistry. Rapid strides are being made in this particular department towards obtaining pictures which will serve to show clearly the conditions present in the tissues so that accurate interpretations may be readily made. Unquestionably this is necessary before any treatment is attempted.

One of our foremost investigators, Dr. C. Edmund Kells of New Orleans, La., has perfected a system by which two pictures of the same area are taken, each from different angles, with the result that when the pictures are suitably mounted and focussed it is possible to get results similar to that obtained from the ordinary stereographs with which all of us are familiar.

The method of taking, developing, mounting, and focussing these films, though perhaps somewhat simple for the expert, may prove rather difficult for the less skillful; but Dr. Kells assures us that the results obtained will amply repay any effort.

Two ordinary skiagraphs of the region involved must be taken upon separate films from points about two and one-half inches (the pupillary distance) apart. The distance from the films to the tube does not appear to affect the result, but probably from ten to twelve inches is the best measurement for this line. The outstanding difficulty in this method is that the patient must not move during the process of changing the films, and the second film should be placed in about the same position as the first and exactly upon the same plane.

The technique evolved by Dr. Kells is too elaborate to allow of complete report in this review, but may be obtained by referring to the April, 1919, issue of "The International Journal of Orthodontia and Oral Surgery."

The advantage of this method of examination is aptly summed up in these words:—"For illuminating a case under consideration, a plain skiagraph will compare to a stereograph about as the moon on a cloudy night compares to the noon day sun in a cloudless sky." It is to be hoped that research work along this particular line will result in a simplified process for obtaining these stereographs and added importance will then be attached to the pictures as a means of making a more accurate diagnosis.

Some Root Canal Problems

The following series comprises a Symposium of Five Papers read before the Missouri State Dental Association, April, 1919, and published in Oral Health by courtesy of The Dental Summary. This series of short papers upon this vital question, along with Dr. Coolidge's paper, which appeared in a recent issue of Oral Health, will doubtless be read with great interest and profit by the members of the Dental profession.—Editor.

WHAT BASIC PRINCIPLES OF PHYSIOLOGY ARE INVOLVED IN THE DESTRUCTION OF BACTERIA WITHOUT THE DESTRUCTION OF TISSUE CELLS?

BY D. G. STINE, M.D., COLUMBIA, MO.

FOR decades the medical profession has been searching for some substance that, while deadly in its action for bacteria brought in contact with it, would still be harmless to normal tissue cells, even young growing cells.

The search has been for some substance that has a harmful affinity for bacterial protoplasm, just as curare has for the cells composing the motor end organs of motor nerves. So far medicine has discovered only two such substances—*first*, quinin and its action on the plasmodium malariae; *second*, salvarsan and its action on the spirochaete pallida.

In these there is undoubtedly an affinity of the drug for the specific micro-organism, but they cannot be said to be absolute in their ability to rid the body of the organisms for which they are specific, nor are they absolutely harmless in their action on body tissue.

The war brought forth numerous attempts to find solutions in the presence of which bacteria die, but injured tissues can start their process of repair.

This subject that has been given me is an enormous one and applies to all tissues; so I will limit my essay to the destruction of bacteria in and about the teeth without the destruction of tissue cells.

The subject falls naturally under two headings—*First*, the sterilization of the mucous membranes of the mouth and the soft tissues about the teeth. Every bacteriologist knows that after a few hours of gargling and mouth-washing with weak solutions of disinfectants such as Dobells, 10 per cent. alcohol, that it is almost impossible to obtain a growth of bacteria from an infected throat. However, this must be due to the mechanical washings of the surface, because bacteria will grow in culture medias made up of these solutions; and simple

non-disinfecting washes, as weak salt and soda solutions, will produce the same results.

Stronger disinfectants destroy the cellular structure of the mucous membranes. Tincture of iodine is especially deleterious to this delicate protecting structure.

Where there is suppuration of the soft tissues around the teeth the method of Carrel-Dakin is the only procedure to my knowledge that can sterilize the pus pockets and not harm normal cells. That is the laying open of pus pockets and irrigation with dichloramin solution, or the application of a dichloramin paste. It has been proven that young tissue cells will grow in this solution and that bacteria are killed by it.

As the proper chemical sterilization of a wound or lesion can be carried out properly only by a strong germicide, which is non-toxic and non-irritating, it is plain that none other answers this purpose in this locality. Tincture of iodine stronger than 5 per cent. is too irritating to be used on mucous membranes and weaker than this it is not germicidal. What is true of iodine also is true of mercury-bichlorid and the phenol group.

RESULTS FROM ATTEMPTS TO STERILIZE FOR INJECTION OF NOVOCAIN.

Second, the sterilization of the field of operative invasion or diseased cavities within the tooth or in the maxillary bone. When is such sterilization needed?

(a) To sterilize and clean infected root canals; to protect dentin from infection. This may be necessary, but thorough mechanical removal of infected material is probably better.

(b) Would one attempt to treat with an antiseptic a large alveo-dental abscess in which the apex of the tooth projected as a foreign body? That would be too poor surgery.

(c) Would one attempt to sterilize a cavity at the bottom of which was a tooth apex, denuded of peridental membrane and with eroded cementum? There is to my knowledge no medication nor method, germicidal, oxidizing or electrolytic, that will revivify a pus-soaked, partly-absorbed tooth apex.

(d) Would one attempt to sterilize an abscess cavity out of which the canal for drainage was out of all due surgical proportions to the size of the abscess? No.

(e) There remains then the condition where the cavity occupied by the chronic abscess or rather by the granuloma is small and of surgical proportions to its drainage canal (the pulp chambers). How can we sterilize this without doing more harm than good?

We have infected the bone, a difficult tissue to disinfect, as bacteria have invaded seemingly normal cancellous bone for some distance from the abscess cavity. We cannot inject into the bone a

germicide of sufficient strength to destroy all bacteria without causing the necrosis of healthy bone. Not only that, but we destroy a protective barrier nature has placed around the cavity that is superior to any we can substitute—the capsule of the granuloma, the great effort of nature to wall off the seat of inflammation. In general surgery we have learned to respect these natural barriers.

In regard to the electrical sterilization of this area of bone, I am not familiar enough with the process to answer. Ionization has a supporter in Dr. Rhein, of the University of Pennsylvania. I can only say that electric current itself never has killed bacteria. The galvanic current used, I believe, in ionization would kill bacteria when zinc or other substance acted as an electrode, but the action would be that of a cautery only, with the resulting necrosis of bone.

Why is there any need of any greater germicide than the natural germicidal action of the tissues, if after the pulp chamber has been carefully cleaned, a filling be introduced, the apex properly insulated, and the X-ray shows an ossification of the area of lessened density, accomplishing the same recovery as when the general surgeon injects a chronic suppurating bone sinus elsewhere with bismuth, or other type of paste?

There is not to my knowledge any process that will kill bacteria in infected bone without destroying bone cells;

First, because some bacteria are out of reach of any agent that does not destroy the bone to come in contact with them.

Second, there is no agent except a chlorin-liberating, and, as in the hyperchlorous or dichloramin solutions that I have mentioned, that will kill the bacteria without damaging tissue cells.

CURRENT PRACTICES THAT TEND TO FAVOR INFECTION IN TOOTH STRUCTURES AND PERIAPICAL TISSUES.

BY CHARLES P. GROSBY, D.D.S., ST. LOUIS, MO.

THE subject that I am to talk on to-day is, to my mind, the most important problem that the dental profession has to deal with: namely, the answer to "What current practices tend to favor the establishment of a condition of infection in tooth structure and periapical tissues?"

As I am to have but fifteen minutes I will give you my view of the subject, and cover as much ground as I can in the time allotted me. The answer to the above is of great importance, and is indeed a serious one. The general trend of practices that we would naturally suspect and believe to cause these conditions are our faulty root-canal technic, ill-fitting crowns, bridges, defective interdental spaces, over-

hanging fillings, malocclusion, and a great many other conditions of faulty technic.

On the other hand other great factors which enter into the subject of establishing a condition of infection, are the negligence of the patient in properly following up treatments; medicinal agents left too long; the negligence of keeping arsenical preparations in the tooth too long, thereby causing a pulp to be of lowered vitality open to disease, and itself becoming a medium for infection.

Unclean methods in the filling of root canals; care in not opening restricted canals, and those canals that almost seem not to exist. The passing of a broach into a putrescent pulp thereby pushing infection further down towards the apex.

Pressure of a piece of temporary stopping, sealed over a treatment covering a putrefied infected pulp, thereby forcing part of the contents through the apex.

It is these little things so important that we overlook which cause these conditions. We are prone to admit that we are a little lax in some of our methods because as yet we don't fully appreciate and realize the great importance of the elimination of these infectious areas. We are negligent in not obtaining the proper X-ray findings which we should seek, together with the clinical evidences, in order to assist us in this work in avoiding the practices which cause periapical infection.

Periapical infections usually result from the passage into the periapical space of the results of saprophytic pulp destruction, aided by the gases that arise therefrom, or by the continuation of suppurative pulp processes followed by the invasion of the soft tissues of pyogenic cocci. The general body resistance, or immunity, if you please, controls the action of the toxicity of the organism. Diathesis thus plays its important role here as in other dental diseases.

Herein lies the important point in the study of periapical infections, how much tissue liquefaction has occurred, and how long the apex has been bathed in pus.

In our daily work we must take into consideration the vitality of a root apex before any other methods or material for root-canal fillings. Therefore, our attention is called to the patho-histology of the periapical cementum in which the apex of every tooth terminates, and through which the pulp vessels pass. The most cancellated of dental structure, if once exposed to infection, is most difficult to free from it. Hartzell has shown this clearly.

If the fibres of the peridental membrane which penetrate the cementum be liquified, if the dental pulp be suppurating or gangrenous, if it be exposed to pus containing pathogenic cocci with its nutrient supply cut off, cemental necrosis or infection will follow.

Gentlemen, the current practices which tend to favor the establishment of a condition of infection in tooth structure and periapical

tissue is caused by some *error* in judgment or technic on the part of the dentist, possibly from a lack of knowledge of the dangers resulting. There should be no excuse. Not knowing the law never excused its infraction. We must keep well informed in general pathology. Generally, haste in order to save time on the part of the operator who knows better is most reprehensible.

Here again I will hurriedly give several more reasons: Small shreds of necrotic pulp tissue left in the pericemental apex; the application of mummifying paste to the apical third of the pulp; from the honest operator's attempt to treat tortuous canals which cannot be filled, and his unfortunate assumption that the tooth is a normal one, when it is not; from the sealing in of pyogenic cocci introduced by unclean methods and, as I have stated, the over-devitalization not alone of the pulp, but the pericemental apices as well.

The importance of the vitality of the pericemental apex of which there is danger of necrosis in pulp devitalization, and the risk of continued medication are conditions to be considered.

Any of these defects tend to establish an area of lowered resistance, which we may well describe as a porous culture tube which at body temperature makes an ideal culture for the growth of pathogenic organisms.

The condition which arises from the practices which I have stated that tend to establish infection is the granuloma or blind abscess, and we believe that Dr. Gilmer is correct in his statement, that "Over twenty-five per cent. of all adults have alveolar abscesses in some form." But we do not believe that it necessarily follows that even twenty-five per cent. of this large number will show systemic damage from such abscesses. The immunizing powers of the blood and tissues must be recognized in this connection. Still we must abolish the causes that are responsible for these infections.

The profession of dentistry has achieved a personality and it is making a demand which cannot be ignored. There is before us a compelling situation which we must satisfy. There must be a parting of the ways from the old local to a new and general oral pathology, so we can and must overcome these current practices which tend to favor the establishment of a condition of infection in the tooth structure and periapical tissues.

ELECTRO MEDICATION.

BY W. H. JORDAN, D.D.S., KANSAS CITY, MO.

THE subject of electro medication has in the past been considered only from the standpoint of cataphoresis, but in view of comparatively recent discoveries, ionization is considered to be the major branch of electro-therapeutics. It was thought that cata-

phoresis increased osmotic pressure, that is, a drug *en masse* would enter the tissues only in the direction of flow of current, by dialysis. It is now thought that what really occurred was iontophoresis, commonly called ionization, which is the driving of particles, carrying an electric charge, into the tissues for therapeutic purposes. With this point established it is readily understood that electro medication necessarily must deal only with iontophoresis; and in this short paper I shall confine myself to that subject, briefly discussing the principles and effects, and refraining from technicalities.

Electric conduction of a substance through the tissues of the body means transporting of electrically-charged particles from one pole of a battery towards the other.

These moving particles are ions, and there is a double movement to be considered: ions carrying a negative charge moving towards the anode, and ions carrying a positive charge towards the cathode.

This is true regardless of the direction of flow of current, and flow of current really has no importance in iontophoresis. I may explain this better by saying that, if two electrodes connected to both poles of a battery are placed in a vessel containing a salt solution, the sodium chlorid is dissociated to a certain extent, some sodium ions, which carry a positive charge, collecting at the cathode, and some chlorin ions, which carry a negative charge, collecting at the anode; this is ionization.

In carrying ions into the tissues it is necessary to know what kind of charge the desired ion carries. For example, if chlorin is the desired ion in the treating of a suppurative or inflamed condition, the normal salt and the negative electrode is placed in the canal or pus pocket, and thus the chlorin ion travels into the tissues toward the positive electrode, which is in contact with the body at a more or less distant part.

The ions will not pass through the tissues in a direct line from pole to pole but will branch out, seeking paths of least resistance. This means the ionization of a wide area and eliminates all possibilities of failure to reach all parts of the lesion under treatment, provided the current is on for a sufficient length of time.

In order to secure as much density as possible, that is, get as many ions in the part as may be, it is desirable to place both electrodes fairly close together.

In considering body resistance to the current, it is found that persons in poor general health resist more than do those in vigorous health and calm, non-excitabile people resist less than do nervous people.

Nerve, blood and muscle tissue are, in the order named, the best conductors. Dentin is not nearly so good, and enamel resists the current completely, unless there is moisture present to carry around it. These factors should be noted before iontophoresis is used in order to

arrive at the proper current strength with some degree of accuracy.

The current has the effect of stimulating the motor, sensory and special nerves nearest point of contact.

Metallic electrodes in contact with the soft tissues produce acid and oxygen at the positive, and alkali and hydrogen at the negative, giving an active caustic effect at the negative, and because of this, metallic electrodes must not come in contact with the tissues, but the contact made with a large electrode, such as a damp sponge on the soft tissues, thus getting distribution over a wider area.

In treating infected root ends this is accomplished by placing the aqueous solution in the canals together with the electrode of proper polarity, the other electrode connected to a damp sponge and placed on the face or the neck in the region of the affected tooth.

Different ions are indicated in different cases, but all substances are not dissociated by the current; and such as ethers, alcohols or chloroform cannot be used. If sterilization is desired, zinc, copper, or silver ions are indicated, but in this connection it should be remembered that anything which will destroy the protoplasm of bacteria also will destroy the protoplasm of tissue cells since the two are identical; nevertheless these ions are at times indicated as they are not so readily affected by absorption because of a certain amount of coagulation of albumin, and in infections of far reaching effects, long continued sterilization is, of course, desirable, regardless of some tissue-cell loss.

The chlorin ion, dissociated from sodium chlorid, or any metallic chlorid, has the property of softening and dissolution of fibrous or granular growths such as a granuloma, probably increases phagocytosis, has some antiseptic properties, and without doubt is indicated in the abscessed root where no systemic reactions are apparent, or very little bone destruction has occurred.

The cocain ion has been used for anesthesia but because of its toxicity its use is not considered practicable.

Just a word about the technical use of a few of the various ions. If zinc is used a zinc electrode and a 3 per cent. solution of zinc chlorid is placed in the canal or pus pocket, with the positive pole in the solution and the negative on the face. If copper is used a copper electrode and 2 per cent. solution of copper sulphate in the canal or pus pocket, using the same polarity as in the use of zinc. If sodium chlorid or iodine is used the solution is placed in the same way but the polarity is reversed, placing the negative in the canal or pus pocket, the kind of electrode used making but little, if any, difference, since metallic ions from the electrode are attracted to the negative.

There are many other useful ions and it will be noted that a knowledge of the kind of charge the various ions carry is essential.

The advantages of ionic medication in dentistry are many. It is not in the least painful, if the proper current strength is applied, is extremely effective, placing at our disposal a method of reaching deep

infections with disinfectants, antiseptics, and sedatives, and is very easily carried out, with a simple, readily-obtained apparatus. Marked improvement is apparent immediately and is unmistakable by both patient and operator.

In the time allotted to me it is impossible to give histories of individual cases in this paper. Will say, however, that twelve to twenty-four hours after ionizing canals from which I had grown cultures of staphylococcus, streptococcus, and many other organisms I was unable to get a culture of any pathogenic bacteria whatever, and immediately after using iontophoresis in these pus-discharging canals I am able to seal the tooth with no other medication of any kind and have no swelling, pain, or other ill effects.

On the other hand, cases in which I did not use iontophoresis, but where the pus had stopped flowing, the canals appeared perfectly dry, no soreness present, and yet I was able to grow cultures of pathogenic bacteria, proving to me that my medication applied as dressing was ineffective.

I do not wish to be understood, however, as trying to establish iontophoresis as a cure-all. In using it we must mechanically remove as much pus and debris as possible, and expect the ions to reach only such parts as cannot be reached mechanically.

In conclusion I want to say that iontophoresis is proving to be the most dependable and easiest method of treating oral infections, and is worthy of the most thorough investigation by the dental profession, especially in view of the grievous experience of all of us in treating such cases in the past.

A CONSIDERATION OF MODERN METHODS AND MATERIALS FOR FILLING ROOT CANALS.

BY EWING P. BRADY, D.D.S., ST. LOUIS, MO.

IN the restoration of teeth in which the pulp must be extirpated, we should bear in mind at all times the fact "that there are two extremities of the tooth to be filled." The filling of the apical portion should receive the same painstaking efforts from us because of the fact that we as dentists are alone the judge of our work, while on the other hand the patient at least has some conception as to the character of the filling, making the restoration of visible portions of the tooth. It reflects upon the dignity of our profession to use every means at hand to make this part of our operations as near perfect as possible.

Before taking up the subject of modern materials used in filling root canals, I want to say that I find some very peculiar methods used in filling root canals, judging from the findings which I have made in dissecting extracted teeth which have found their way into

my hands. Gentlemen, the day of cotton root-canal filling is not past by any means; neither is the epoch in which amalgam is simply pushed into the pulp chamber with the remnants of the pulp in the root canals. Another unique method is the use of germicidal black copper cement, pushed into the pulp chamber, expecting the remains of the pulp to be mummified. The Lord only knows if the pulps were vital before this treatment was used! Judging from the amount of coagulated blood in the pulps, I should say that there was every evidence that the pulp tissue was partially vital—possibly; and I will say with a certainty these methods have to answer for the fact that the teeth were prematurely lost.

FILLING ROOT CANALS.

The question of filling root canals is a very difficult one and as we know requires an immense amount of energy on the part of the dentist.

The filling of a root canal, and also when it is perfectly filled, are subject to debate. The X-ray shows us all degrees approaching to what I hesitate to call perfection.

I am going to make a rather radical statement, and I know all will not agree with me, but my experience has proven that what I say is true: *A canal which shows the root filling slightly protruding through the apical foramen by the X-ray is the only canal in which the naked eye can positively determine that the filling material actually has reached its destination.*

A filling material may fall short a very small fraction of an inch, say one micron, or even a greater distance, say a twenty-fifth inch, and still the eye could not perceive this deficiency by the X-ray; and yet we all criticise X-ray findings in which this distance is very great. In regard to the micro-organisms which may infect this area, they do not require more space than is mentioned in the first figures to set up an active infection.

Another question which must be taken into consideration is: Do our root-canal filling materials hermetically seal the apical foramina, even if the root-canal filling should penetrate through?

This must be looked at from two points of view:

(a) Dentin which may contain organisms that at a future time may again find opportunity to escape, and pass through the apical foramen and cause trouble.

(b) Invading organisms from the blood may find lodgment in the tooth, and start up infections in the organic matrix of the dentin. As you know this material is composed of protoplasmic processes from the odontoblastic layer of the pulp or membrane of Eboris, which would serve as a fertile field for the proliferation of the organisms. The point to keep under consideration is the fact that the body-fluids carrying infection may find their way between the root-canal filling and the sides of the root canal, if this apical position is not hermetically filled. I will speak of this condition later.

MODERN METHODS.

Under this head I would consider the reaming out of all canals. I wish to emphasize the point of reaming out *all*. I find there are very few canals especially in the molar region which do not require such treatment. I use a style A, X-fine Kerr pulp-canal file, and then follow with the style A No. 3 file. If it is not possible to enlarge with these instruments, it is advisable to use kalium natrium alloy; and comparing this reagent with 40 per cent. H^2SO^4 , it is my experience that it acts much more rapidly. Dr. Chamberlain has emphasized the use of these instruments, and it is not necessary for me to deal with it any further.

After the canals have been opened up, the best procedure is to use diagnostic wires and have the case X-rayed. I wish at this point to quote a case that came under my observation a few weeks ago. Lower molar; opened up canals as described, and found that the root-canal file penetrated very deeply; surmised the tooth had a very long root. Patient gave no pain-response when the broach was passed deeply into canal. Upon X-raying found that the broach was protruding one-eighth-inch through the apical foramen, due to the condition at the apical space. I determined to have the tooth extracted and found the picture as just described.

When the canals are ready to fill, that is if the pulp has been removed due to a simple pulpitis and no putrescent condition present, my next procedure is to use the silver nitrate treatment. If the tooth has been infected, that is if a putrescent condition is present, I recommend treating the infection first and when you are ready to fill canals then use the silver treatment.

Dr. Chamberlain has taken up the subject of silver and formalin treatment of canals, and as this subject is a "Method Used In Root Canals," I wish to say just a few words along this line. The work I have been doing in this field I will demonstrate this afternoon with specimens, so that a word on this subject now will give everyone an understanding of what I am attempting to show in my clinic.

I want first to call your attention to two points in the use of silver in root canals.

First, the solution of ammoniacal silver nitrate should be prepared properly. Last week I made the statement at a dental meeting that this was a simple matter. Upon meeting several practitioners who had attempted to prepare the solution, I find that what was simple for me was not as simple for them, as they had not given the time to this work I had.

If you take the directions to the druggist he invariably fails to get the results that he should obtain. The cause of the error is in the quantity of ammonia which is present in excess. If there is an excess of ammonia, the solution will set up a pericementitis. Another fact

which should be borne in mind is that in preparing the solutions the object should be not to dilute the silver solution so much that the silver content is too low.

Second, precaution: Do not use this solution in a putrescent root canal for the reason that the infection will be forced through the apex; and then when you reduce the silver, the silver will clog up the canal and thus in a measure seal up the periapical space from the root canal; and if the tooth be sealed up with cement or stopping, an abscess will result. The point arises, is not this solution antiseptic? Yes, it is; but it does not reach the zone of infection.

In the modern methods of treating root canals the object is not only to fill the root canals to the apex, but also to act upon the organic tissue within the dentin, and change it to such an extent that the organism which may be present and also any organisms which may reach this site at a future time will not find a fertile field to proliferate and set up an active infection.

Dr. Percy Howe has introduced the ammonical silver nitrate method, and working along this same line I have been using various other methods in order to get away from the effect which might result from any excess of formalin which he uses as a reducing solution. In this regard I have used ammoniacal silver nitrate, and thrown down the silver with zinc and copper wires; but I find that this method is not satisfactory, because the silver is liberated from the wire and is thus attracted from the dentin. The same silver solution and a dilute solution of nitric acid was next used. In this case the silver was freed from its combination with ammonia and ammonium nitrate was formed. The silver which had penetrated deeply into the tissues was then liberated to cause a precipitation of the proteins of the cells. The penetration was facilitated by the use of ammonia, without which only a slight action would have resulted, as Prinz says, about one-fiftieth of an inch.

I tried also a solution of gold, figuring that it would not cause such a dark discoloration; and the gold could be precipitated from solution and would not be so liable to any secondary action from the body secretions. I have this solution in a good way to success, and I expect within a few months to be able to make some definite statements upon this subject.

ROOT-CANAL FILLING MATERIALS.

Without a question of a doubt this branch of dentistry must be improved upon, and the subject as it presents itself at the present time is as follows:

First, we do not possess a permanent material which will absolutely seal the apical foraminae and prevent the tissue fluids from entering the root canal from the periapical tissue; and also the organisms in the dentin may escape and find their way to the periapical tissue by passing down beside the root filling.

Our difficulties are made greater by the anatomical make-up of the root canal at the apical portion. The X-ray may show our root-canal filling material completely filling the canal, but this is a very poor guide, for the reason that invariably the pulp does not enter the tooth by a single foramen but through multiple foraminae.

I am not discrediting the X-ray because I feel that it is one of the greatest adjuncts that the dental profession has received in the last years.

GUTTA PERCHA AND EUCALYPTOL COMBINATIONS.

"Eucalyptol is oily in nature, and lubricates the canal and assists in the ready introduction of the gutta-percha cone, and also facilitates the removal of the filling material at a future time if this is desired." From my experiments I find the above recommendation one of the principal drawbacks to the use of this material in root canals, for the very reason that the eucalyptol prevents a firm union of the gutta percha with the surfaces of the canals; and further this oil will be removed in time and leave a leaky joint between the canal and the root filling. To prove my statement I have specimens which show that fluids can creep up between this material into the root canal for a considerable distance.

CHLOROFORM SOLUTION OF GUTTA PERCHA WITH GUTTA-PERCHA CONE.

This material contracts upon the removal of the chloroform and this also will leave a leaky joint. I find that this shrinkage is not as harmful as the results produced in the eucalyptol method; however, there is some danger in forcing some of the chloro percha through the apical foramen in causing irritation.

CALLAHAN'S METHOD.

This method to me has several drawbacks as a filling material. It has advantages over the other two methods as to its sealing properties.

The drawbacks may be classed as follows:

(a) The difficulty met with in introducing the gutta-percha cone and in the pumping motion to form chloro percha with the rosin solution. The cone bends upon itself and we do not get the deep penetration which is necessary.

(b) If delays are encountered in introducing the cone, the chloroform evaporates and results in a sticky mass in which it is impossible to pump the cone. More chloroform solution may be introduced, but there always are some surfaces which do not come in contact with this further addition of chloroform.

(c) The canals should be absolutely dry. Otherwise I find that the rosin is found to form a precipitate which is porous.

(d) If excess of the solution be used to prevent the stickiness of

the canals some of the chloroform is forced through the apex, resulting in the production of pericementitis.

FEDERSPEIL'S METHOD.

In this method a saturated solution of gum copal in acetone is used; the solution then filtered through cotton, and is ready for use. The acetone is compatible with water and this overcomes the objection I raised to Callahan's method, as the canals may contain some moisture and still be taken care of by this method. The copal solution is pumped into the canal and the silver wire is forced into the canals. This wire acts as a core and carries the copal solution with it; it also serves as a radiopaque material in taking an X-ray to determine if the canals have been filled.

WHAT CONSTITUTIONAL AND CLINICAL EVIDENCES WILL AID IN DETERMINING WHETHER A TOOTH SHALL BE EXTRACTED, TREATED, OR LEFT UNDISTURBED?

BY F. G. SCHMITT, D.D.S., SPRINGFIELD, MO.

THIS is a very important subject and must be considered from all angles. To begin at the proper point, we will eliminate the consideration of all teeth having small cavities and which require no devitalization.

Second, we will consider all teeth in which we find the cavity extending near the pulp, in which there has been but slight pulpitis or pericementitis, as teeth to be treated, nerve extirpated, and root properly filled, regardless of the patient's constitutional condition.

Third, all teeth in which caries has progressed to the point in which the pulp has been exposed to the oral flora, must be considered as infected. At the same time, the pulp may possess a normal degree of resistance to the infection, so as to overcome the same for a period of time. These teeth after proper antiseptic or prophylactic treatment, should be devitalized and the root properly filled.

Fourth, teeth in which we find putrescent pulps, even though no suppuration be present, always should be regarded with suspicion, but not be condemned too quickly. Bear in mind under this class, I do not mean teeth which show the formation of unhealthy granulation at the apex. I mean simple putrescent pulps with no other complications. At this stage of the game, we must begin to look for constitutional conditions, to assist us in a decision in regard to the prognosis. A simple putrescent pulp may harbor certain germs, which may cause disturbances in the patient's general condition, especially arthritis, in which we usually find the streptococci viridans playing an important part.

Now the fact that a patient has arthritis and happens to have a tooth or teeth with simple putrescent canals, should not lead us to extraction immediately. It is essential that we eliminate the possibility of focal infection elsewhere. The patient may have chronic gonorrhea; he may have infected tonsils; he may have sinusitis; anyone of which might be the primary cause of the systemic condition. After eliminating all possibility of focal infection elsewhere in the body, and having a patient with arthritis (especially acute), and a culture showing the streptococci viridans in luxurious growth, personally I would not hesitate one moment to condemn that tooth or teeth to the forceps. A simple putrescent pulp, not accompanied by apical complications, and the patient otherwise in normal condition, should be treated. Never permit a tooth in which the nerve is dead, and in which the roots have not been properly filled, to remain undisturbed, because sooner or later that condition will be throwing poisons into the system, and cause not only local, but in all probability systemic disturbances. There are other systemic conditions to be considered, but we will discuss them under another head.

Fifth, we now arrive at the point where we find apical infections, peridental infections, pyorrheal infections, syphilitic infections, etc. We will consider teeth having acute apical or peridental abscesses, with or without a sinus, with very little destruction of hard and soft tissue, and no systemic disturbances, as teeth to be treated. One of the clinical manifestations in many cases of acute abscess formation is fever, and the dentist who will use his thermometer often will detect pus formation in its incipency. In our office, the thermometer is indispensable. The forceps should be applied to all molars, when the alveolar spicula between the bifurcation of the roots has been destroyed by pus. This of course is only discovered by the use of the radiograph.

When we consider teeth having chronic infection, be they apical or peridental, we always must take note of the patient's normal resistance and general condition. Many of the lesser ills of the body in the form of subjective soreness of the tissues, nerves, muscles and joints, are the result of slight focal infections in the mouth or throat, or some other part of the body, especially so in people possessing a low degree of resistance.

Chronic apical abscesses in patients in otherwise normal condition and having a high degree of resistance, should be treated, providing the tissue destruction is not too great. If the infection has denuded the apical portion of the root, amputation of the same may be resorted to and in that way the tooth be saved.

We must bear in mind the bacteriological findings in acute and chronic apical abscesses. The following bacteria usually are found: Streptococci, chiefly streptococcus viridans and hemolyticus, staphylococcus aureus and albus, pneumococcus fusiform bacilli, amoeba and

other less important germs. I mention these because I believe the clinical examination should include a bacteriological study, before the course of procedure shall be decided upon.

Let us consider a patient suffering with either parenchymatous or chronic interstitial nephritis, and after eliminating all possibility of focal infections elsewhere, we find a number of chronic alveolar abscesses, or a case of pyorrhea. We know that the systemic condition is sometimes the result of bacterial toxins. In the case above mentioned, we may safely conclude that the absorption of toxins and their consequent elimination probably is the cause, or at least is aggravating the condition. In a case like this, the immediate eradication of the aggravating cause (the focal infection) is essential, the teeth should be removed, sockets curetted and properly treated.

When our patient has endo-, myo-, or peri-carditis, and after eliminating all other focal infections, we must take the general condition into consideration, and remember that the cause usually is an irritant circulating in the blood, and in some instances an organism, such as the staphylococcus pyogenes, or the diplococcus pneumoniae, all of which also might be the primary cause of the abscess or pyorrhea. We should not hesitate to extract the infected teeth in these cases.

Chronic apical abscesses might be the cause of infective arteritis, because the germs from the same may find their way into the walls of the blood vessel via the blood stream. Chronic infected foci should be eliminated in all cases of infective arteritis, regardless of location; therefore, we should not hesitate to use the forceps when we find the patient has chronic apical, peridental or pyorrheal abscesses. The sooner the foci are cleared up the better.

When the clinical examination shows the patient has suppurative inflammation of the lymphatic glands, especially of the head and neck, and after elimination of all other foci except chronic abscesses of any type, those teeth should be extracted.

When a diagnosis indicates an acute or chronic peptic, gastric or duodenal ulcer, and the patient has a chronic abscess or a pyorrhea of long standing, we must not overlook the possibility of further aggravating the ulcer, and every effort must be made to remove the foci. The radiograph must be depended upon as to whether the tissue destruction is very great. If there is a possibility of eradicating the foci by treatment, it should be tried. If local conditions are bad, the teeth should be removed.

Many times the constitutional condition presents an acute, or we might say, a spontaneous osteomyelitis in connection with chronic abscesses and pyorrhea. Often no other foci are found. In young persons it is sometimes advisable to treat the abscesses. In case of advanced pyorrhea in grown persons, it is advantageous to extract.

Thyroid enlargement, usually of a chronic type, associated with evidences of thyroid intoxication in many young women patients, must

be taken into consideration. After eliminating rheumatic fever, tonsillitis and sinusitis and finding the alveolar abscess or abscesses are of the chronic type, and a possibility of a complete cure is doubtful owing to the tissue destruction, etc., we always should condemn that tooth or teeth.

Even though the amœba may not be the primary cause of pyorrhea, it is present in many instances, especially so in chronic cases. Many times we find pyorrhea patients suffering with chronic dysentery, of the amœbic type. Here as in all focal infections, we must study the bacteriological findings, note the degree of tissue destruction and the patient's power of resistance. In most cases it is advisable to extract.

It is sometimes advisable to extract teeth with chronic abscesses, when the constitutional conditions show an abnormally high blood pressure, with no other apparent cause. In a number of such cases under our observation the blood pressure was reduced after extraction.

Although rare, we must look for tubercular manifestations in cases of infected jaw conditions. Teeth may loosen, as though from pyorrhea. Again we must resort to bacteriological examination to scientifically arrive at a decision. If tuberculosis is present, extraction and radical curettment is indicated.

Besides the ordinary pus infections, we find other conditions which attack the bone and sometimes simulate pyorrheal and apical abscesses. A snapshot diagnosis is sometimes the cause of the loss of serviceable teeth in specific infections. Syphilis may affect the bone, surrounding the tooth or teeth, as a thickening of the periosteum, which occurs after the secondary lesions have subsided. In tertiary lesions the bone substance around the tooth or teeth may be replaced or killed by gumma, which find their way into the soft tissue. These may break down and discharge pus very similar to an abscess with a sinus. If there is the least suspicion a Wasserman should be made; should the reaction be positive, the tooth or teeth involved should be left undisturbed, and systemic treatment resorted to.

We often find the formation of dental cysts over or rather surrounding the apex of devitalized teeth. In these cases the removal of the cyst and amputation of the apical end is indicated.

Antral infection is of importance in deciding whether abscessed teeth should be treated or extracted. One should remember the clinical manifestation of maxillary sinusitis. The objective symptoms are both intra-nasal and extra-nasal. The intra-nasal are the presence of pus, or a plug of mucus and pus, or an irregular discharge of pus under the centre of the middle turbinated bone. We sometimes find a bulging or rupture into the orbit with exophthalmos, or there may be a thinning or bulging of the exterior antral wall. The X-ray or transilluminating lamp is of value. If the antral infection is

due to an alveolar abscess draining into the sinus, by all means extract the offending tooth.

This subject covers a vast area, but owing to the time allotted, I have attempted from my personal experience to give you some of the constitutional and clinical evidences which will aid in determining whether a tooth shall be extracted, treated, or left undisturbed.

Technique of Bone-Grafting

THE fragments are exposed by a long incision along the lower border of the jaw. The motor saw is then applied to the fragments, and a saw cut made along the inferior border extending an inch to an inch and a half back from the end of the fragment, about half an inch deep. Great care must be taken to avoid opening into the cavity of the mouth or into the sockets of the teeth. An osteotome is then driven into the saw cut and a greenstick fracture produced, widening the wedge-shaped gap for the reception of the graft. An interdental splint which previously had been cemented to the teeth of both jaws is now locked with the teeth in normal occlusion. The graft is made by resection, three inches of a rib. This piece of rib is then split on the flat in order that the endosteal surface may be bathed in lymph. Half of the graft is then driven into the slots in the fragment, the smooth side of the rib facing toward the mouth cavity. This leaves the rough, cancellous surface of the graft facing outward and sunk somewhat below the outer surface of the jaw. This depressed area is then filled out by laying a piece of the other half of the rib in the gap with the smooth side out. The fragments and grafts are now fastened solidly in place with kangaroo tendon passed through drill holes. This adds additional security although it is really unnecessary, as the principal graft is self-retaining, being wedged solidly into the jaw cuts in the fragments.—By CHALMERS J. LYONS, D.D.Sc., Ann Arbor, Mich., *The Dental Summary*.

AID FOR SHOULDER CROWN TECHNIQUE.—When adapting the gold base or fitting, upon which the wax contour is to be developed, we frequently have trouble in making a good adaptation. This difficulty may be overcome by looping a gold wire around the upper axial third of the fitting. Twist it up tightly and then drive it down to the shoulder similar to method employed for driving a hoop on a barrel. This wire loop will easily turn the trick by giving a perfect and snug fitting cap. If the wire is of 22-carat or 24-carat gold, it may be left *in situ* while the crown is being developed, and is finished in the usual manner.—F.W.F., in *Pacific Dental Gazette*.



Two Men

[A TRIBUTE TO C. N. JOHNSON.—*The chap at the Linotype, who was detailed to "set" this article, paid a remarkable tribute to Dr. Johnson. He said: "I like setting this stuff. If there were more men in the world like Dr. Johnson it would be a better world to live in. He's certainly a real 'human.'"* Dr. Johnson has the unique distinction of being loved by those who know him, whether personally or by written word.—Editor.]

I KNOW two men who have been to me an interesting study. Both are wealthy. I never knew the one when he was not a "Retired Capitalist," I never knew the other when he was not up to his eyes in business. They are good friends of mine, and I love them both, but they are so diametrically different that it is the most unique study in contrasts that I have ever experienced.

The Capitalist is always magnifying small things out of all proportion to their importance; the Business Man pooh-poohs at any of the ordinary annoyances of life and goes cheerily on his way as if nothing was the matter. If the Capitalist should chance to nick his finger the least bit in manicuring his nails it would have to receive all the latest technique in antiseptic treatment down to the minutest detail; if the Business Man was told he had a cataract in his eye and would have to face a critical operation for it all he would say would be: "Go to it." And there never would result a whimper or word of protest. If you meet the Capitalist any fine morning and ask him how he is, it is always, "Miserable cold that I can't shake off." "This throat of mine is always my weak point." "I have neuritis this morning—in fact I am troubled with it most of the time," etc., etc. And you would not catch that man sitting in a draft for three seconds unless he was chloroformed. If you ask the Business Man how he is it is always, "Fine as silk—Bully!"

If on the gum of the Capitalist there is a small spot less in area than a grain of wheat, which is somewhat redder than the surrounding

tissues, he will want you to treat it, and then after you have done this he will ask for some of the medicine to take with him so his secretary may rub it on the spot three or four times during the day. If in the mouth of the Business Man you find a tooth which is loosening, and there seems little prospect of saving it, and you tell him so, his only remark will be: "All right—snatch it out. It isn't much good there any how." And after you have extracted the tooth his comment will be, "Gee whiz—quick work, that." And he will go out of the office humming a tune.

I have never seen the weather when it exactly suited the Capitalist, and I never saw the Business Man when he knew there was any weather.

The Capitalist is always striving to devise means for occupying his time. He plays golf, but woe betide the day when he is caught out in a shower and gets wet. He goes into a regular course of training and medication to keep from catching cold, and usually winds up by catching it. He actually *thinks* himself into a cold.

With the Business Man time flies. If he takes an afternoon off to play golf, as he sometimes does, he enters heartily into the spirit of the thing and gets the most enjoyment out of it. The afternoon is gone almost before he knows it.

The Capitalist is forever chasing pleasure, and never quite catching up with it, while the Business Man grabs it as he goes along.

These men have upset all my preconceived notions. Ever since I was a boy I have had held up to me the spectacle of the sordid man of business who thinks of little but heaping up dollars, and whose soul is so small that it can compass nothing outside the confines of profit and loss. The man of leisure has been pictured on a par with the man of culture—a being somewhat superior to the ordinary run of men, and supposedly getting more out of life than the common clay which has to work for its living. I have even at times been foolish enough to dream of the day when I might be at leisure, and live independent of the necessity of work, and I am not altogether sure that I would not like to try the experiment for a brief space and see how it would work out. But with the example of my capitalist friend before me—and his is not an isolated case—I should be afraid to cut myself loose from the daily routine of duty even if I had unlimited means. There seems to be something in the urge and stress of necessity which makes for balance and contentment, and which in the ultimate leads to the surest happiness. When one is not constantly occupied, with a definite purpose in life, one is likely to become warped and narrowed and to lose the proper perspective.

I do not believe in a man holding his nose constantly to the grindstone with the sole object of accumulating money; I do not believe in hoarding, or grasping, or trying to force the other fellow out.

Neither do I believe in a man who has been actively engaged in a business pursuit suddenly abandoning all activities and retiring. It is usually fatal—I mean it in the strict sense. I have known many men who have done this, and I have seldom known one who has lived very long after, or who has been happy if he did live. A patient said to me the other day: "Doctor, you are fortunate to be so busy. I doubt if I could stand the incessant strain of your occupation, and yet you are much happier than I. Idleness tends to melancholy." Here was an admission that was a revelation to me. This man had been successful in business, with his mind always on the prospect of retiring and living at ease. He had attained his object, had plenty of money—and yet he was miserable.

The logical thing for men to do is to develop some interest outside of business while they are yet in their prime—something so absorbing that there is full measure of enjoyment in it, and sufficiently tangible to keep them occupied after they are in a position to throw off the cares of a business life. But it must be something useful as well as entertaining, otherwise it will pall on the mind, and it is the mind which after all, more than any other one thing, makes for or against happiness.

I am trying to learn a lesson from the example of my two friends, the Capitalist and the Business Man, and I am aiming more and more to accept the point of view of the latter. With all his intense activity and his heavy responsibility, I am sure he gets more out of life than does the Capitalist. But of one thing I am convinced, that the most difficult problem in our lives is to strike what is called the "happy medium." I have almost come to the conclusion that there is no such thing, and I am sure I have been happier since I stopped trying to find it. If any man solves this problem I wish he would give me the formula.

C. H. Johnson

Eastern Ontario Dental Association

THE Forty-Second Annual Meeting of the Eastern Ontario Dental Association will be held at "The Chateau Laurier," Ottawa, Monday, Tuesday, and Wednesday, June the 9th, 10th, and 11th, 1919. Dr. Harold Box of Toronto, will give a paper on Focal Infections and Pathology, and Dr. I. H. Ante of Toronto, will give a paper on Clinic on Crown and Bridgework. Other essayists on the programme will be announced later.

C. H. JUVET, *Acting Secretary*.

ORAL HEALTH

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TORONTO, MAY, 1919

No. 5

EDITORIAL

The Ethics Governing Consultations

IN a recent editorial we endeavored to emphasize the advantages resulting from more frequent consultations among members of the dental profession over difficult cases in practice. Having done so, it might not be amiss to consider the ethical rules and etiquette governing such consultations.

From the code of ethics of the National Dental Association we quote the following:

"Consultations should be promoted in difficult and protracted cases, as they give rise to confidence, energy and broader views in practice. In consultations that courtesy and just dealing which is the right of all should be especially observed."

When a dentist is called to consult with a fellow-practitioner in a difficult case, he justly considers an honor has been conferred upon him, and there may be some temptation to unduly exalt himself in the eyes of the patient. But the consulting dentist on the acceptance of such a duty should clearly understand the position he occupies in the case. For the time being he is the trusted and honored guest in the office of his colleague, and is in honor bound to so conduct himself in word and deed as not to reflect in the slightest degree on the skill and knowledge of the regular practitioner. Keeping this thought in

mind, the case should be examined and gone into most thoroughly, and if in the course of such examination it is found that in his judgment a mistake has been made in diagnosis or treatment, such matters should not be discussed in the presence of the patient. The consultation being ended, the consulting dentist, of course, takes his departure, and should not have any further connection with the case, unless so requested by the regular practitioner.

In coming to a decision as to who shall be called in consultation, the dentist should take the patient into his full confidence and give considerable weight to his wishes in making a choice. The consulting dentist should render his account for professional services *directly* to the patient.

To-day we are confronted with many systemic disorders arising from bad mouth conditions. This, perforce, gives rise to many interviews and somewhat disjointed consultations between the physician and the dentist. In these so-called consultations the dentist often finds himself in a delicate and trying position. Most physicians, it is true, are fair and considerate, and when they suspect oral troubles as the cause refer the patient to the family dentist, asking for a report as to suspected areas of infection in the oral cavity. In such cases the dentist should make every effort to assist the physician and forward his findings and opinions at the earliest possible moment.

If, as sometimes occurs, the physician is not willing to accept the dentist's decision that a certain tooth should not be removed, it might well be suggested that another dentist be called in consultation and his judgment also be gained in the matter. In all such circumstances we should be patient and courteous, evidencing a desire to solve the difficulty in the best interests of the patient.

In discussing this important subject a word to our dental specialists may not be amiss. In the acceptance and examination of all cases referred to him, the dental specialist should endeavor to uphold the dignity and good name of the family dentist, and in his conduct of the case render every possible assistance in caring for the welfare of the patient. For instance, the radiodontist to whom the patient has been referred should refrain as far as possible from discussing the seriousness or otherwise of the case with the patient, or even hint as to what the radiogram has disclosed. Such findings and opinions should be sent directly to the general practitioner.

Again, the relationship between the family dentist and the exodontist may well be a matter for serious consideration. How many dentists have been face to face with this difficulty? A patient has visited the specialist and had all or a number of his teeth removed without the consent or knowledge of his family dentist. The patient, in most such cases, has acted innocently in the matter. Can we say as much of the specialist? He should know that in such cases, even if it were

clearly a case for extraction, the dentist who is to undertake the artificial restoration should have had the opportunity of seeing the patient immediately before the natural teeth were removed, if he is to render the patient intelligent and satisfactory service.

Concisely speaking, the ethics governing the different phases of consultations may be summed up in the one sentence, "Do unto others as you would that others do unto you."

Luke Teskey, Surgeon and Dentist—Deceased

DOCTOR Luke Teskey, the noted Surgeon and Dentist, of Toronto, passed away on Thursday, 1st May, 1919, at the age of 70 years. Dr. Teskey became ill during February, while in Cuba, and upon his return became gradually worse, finally succumbing to an acute attack of gastritis. The late Dr. Teskey was a graduate of Trinity College, and subsequently was a teacher in both Trinity College and the Royal College of Dental Surgeons of Ontario. Older graduates of the R.C.D.S. remember with deep affection the three great men, Professors J. B. Willmott, Luke Teskey and W. T. Stuart, all of whom have now passed to the great beyond. Latterly Dr. Teskey specialized in Surgery, retiring from active practice about five years ago. To those of us who numbered Luke Teskey among our beloved teachers, his demise has occasioned the greatest sorrow. Sincere sympathy is extended to Mrs. Teskey and family. Among the many beautiful floral tributes from official bodies was one from The Royal College of Dental Surgeons.—*Editor*.

Association of Military Dental Surgeons of the United States

THE Association of Military Dental Surgeons of the United States will hold its annual meeting at New Orleans, October 20-24th, 1919.

R. W. WADDELL,
Secretary-Treasurer.

Officers of the Toronto Dental Society

President—R. D. Thornton.
1st Vice-President—W. H. Coon.
2nd Vice-President—H. A. McKim.
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Auditors—J. A. Bothwell, W. E. Willmott.

“**B**E DISSATISFIED, not with
your lot, but with yourself;
not with what you HAVE,
but with what you ARE. That’s
discontent of the splendid kind, and
will nerve your soul, not sour your
mind.”



IRVIN H. ANTE, D.D.S.

Toronto, Ont.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, JUNE, 1919

No. 6

The Shell or Telescope Crown

I. H. ANTE, D.D.S.,

*Associate Professor Prosthetic Dentistry, Royal College of
Dental Surgeons.*

REGARDLESS of the progress and development of crown work in general the shell crown is still, and probably always will be, one of the best means and methods of making restorations. When this application is indicated, and when the adaptation and construction is practically and skilfully executed, no other method offers any greater opportunity for the serviceable and permanent reproduction of normal conditions.

If dental prosthesis is to maintain the distinction of an art, the practice of placing gold crowns prominently conspicuous must be considered as an offence to art, culture and refinement.

EMPLOYMENT.

Their application is indicated principally on molars, and occasionally on second bicuspsids, but rarely anterior to them; on teeth with extensive loss of tooth structure from carriers, fractured or accidental causes, dislocation, impaired function, malformation, and as abutments for bridges or special attachments.

REQUIREMENTS.

There should always be enough tooth structure remaining to secure staple anchorage. The preparation of the root is governed by the particular style of crown indicated. This in turn is governed by the conditions of the root and by the stress to which it is or will be subjected. It should be constructed so as to reproduce a normal anatomo-

mical form, interproximal space, embrasure contact point, occlusion and articulation, also non-irritating to the surrounding tissues.

It should be constructed on material heavy enough to give adequate strength and withstand constant attritionals and of a high enough karat to withstand the chemical action of secretions. The cusps should be deep and sharp enough to aid in the act of mastication and offer no interference to the motion of the jaw in its normal movements.

ADVANTAGES.

It gives a maximum of strength and stability of attachment. The coronal portion of the tooth is more or less immune to the penetration of secretions and a safeguard against fracture.

DISADVANTAGES.

The tendency to gingival irritation; difficulty of securing close approximity and continuity. It lacks esthetic requirements. The gingi-

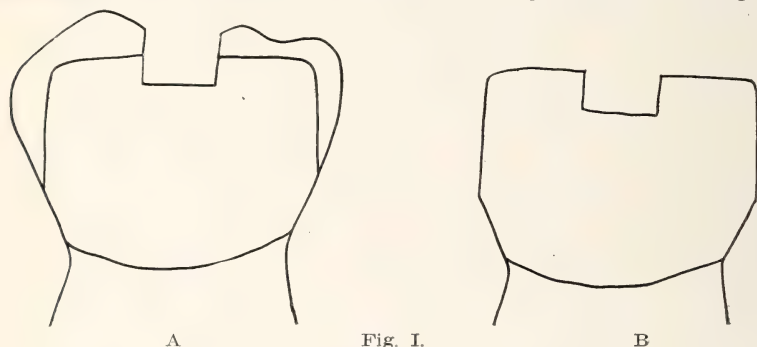


Fig. I.

val enamel is destroyed. Difficulty of reproducing the normal gingival contour. The coronal portion of the tooth is greatly sacrificed.

We are agreed that any mechanical repair is foreign to the delicate tissues surrounding the necks of teeth and contiguous parts, consequently modern methods of procedure will soon eliminate hands that pass under the free margin of the gum and restoration be made so nearly perfect that no more reaction will be manifest than is found around the necks of teeth in a normal condition.

One is impressed with the fact that pulps survive many abuses, which we would consider dangerous. No matter what the handicap, be it crown, large fillings, abutments, etc., it is quite universal to find the percentage of vital pulps high and the apical region normal. The writer is not convinced that pulp degeneration occurs entirely owing to the fact that we have placed large gold restorations or crowns on teeth. In the process of denuding the teeth of enamel we infect the dental tubuli, and this produces a gradual disintegration of the pulp

tissue. It is good practice to treat these cases with silver nitrate at once.

It has been definitely proven that more teeth are lost from pathological conditions and tartar deposits than from crowns. Nevertheless, if crowns are placed on teeth with these conditions existing, whether the mechanical application be good or bad, the ultimate result will be the same, although from the patient's or the medical man's point of view the crown will get all the blame; therefore we should be more careful in the selection of cases, conditions and methods of repair lest we make conditions worse rather than better.

Doctors Ivy and Eisen of Milwaukee give the following:

Of 420 crowned teeth studied radiographically they obtained—

Devitalized teeth partially or completely filled:

Apically healthy 200.

Apically diseased 120.

Vital teeth:

Apically healthy 90.

Apically diseased 10.

Only 10 per cent. of teeth whose pulps were vital at the time of

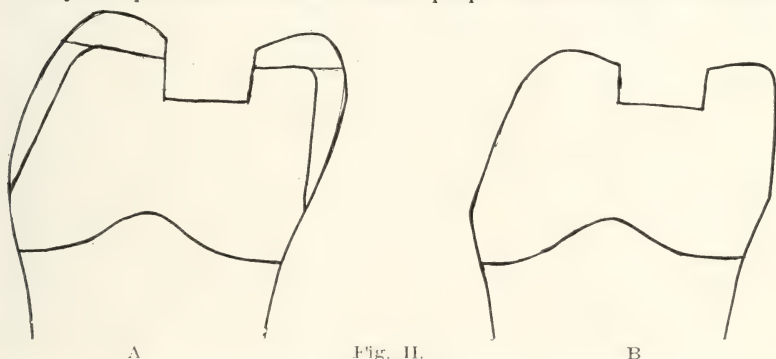


Fig. 11.

crowning became apically diseased, and these were more frequently found as bridge abutments.

These slowly growing convictions are having their influence upon us in trying to conserve pulps which we formerly destroyed without hesitation.

INCORRECT OCCLUSION.

We often find an alteration in the position of the opposing teeth or tooth resulting to a greater or less degree in a change in the occlusal plane of the particular tooth or teeth.

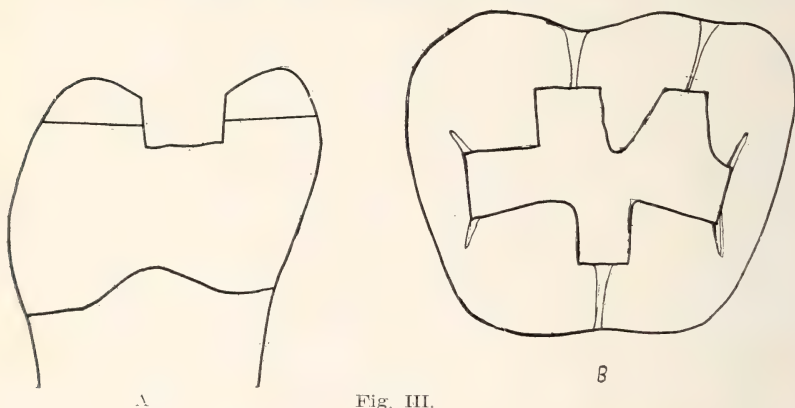
Perhaps the most common fault found in this work results from the failure to study Dental Anatomy and the changes which almost invariably take place in the opposing teeth from loss of function, nor has the practical application of our knowledge of the condyloid path

and of the various movements of the mandible been emphasized in crown work.

It is fallacy to restrain from trimming up an elongated tooth in the opposing jaw which frequently gives rise to faulty articulation. We must conclude that such a tooth may be a sound tooth but not a good useful tooth until it is made to function normally.

We must remember that in our crown operations we are held accountable for the pathologic sequence which may follow malocclusion. The crown articulators on the market do not approximate the normal movements of the mandible; therefore, to overcome these obstacles which hinder the reproduction of anatomical lines we should use nature's articulator and carve our crowns or occlusal surfaces in wax, then place in the mouth and make certain of the anatomical form, articulation as well as the occlusion.

Therefore, our ideal crown must be one that will not demand too



great a sacrifice of tooth tissue; one that does not pass under the free gingivae unless necessary to do so. It should not have any irritating influence upon the surrounding tissues. It must exactly reproduce in all its essential details that particular tooth which it is intended to replace, bearing in mind the normal anatomical form of that particular tooth, the normal width and form of the interproximal spaces and embrasures, the marble-like contact point, the age of the patient and the variations from the normal in order to have the crown in harmony with the environment.

The writer will present to you a technique which, in a large measure, will remove some or all of the disadvantages of the shell crown.

As the teeth are not of normal proportion between the diameters of the crown and the cervix, this necessitates the removal of considerable tooth structure in order that the circumference may be reduced at every point occlusally, and at the uniform expense of each surface at least equal to the exact dimensions of the cervix. This requires the

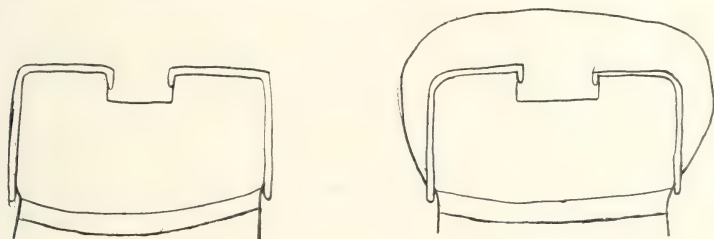
sacrifice of approximately one-sixteenth of the structure from the axial walls and the occlusal one-fourth.

This requirement may be executed on non-vital teeth, but on vital teeth there is too great a sacrifice of tooth tissue (and this is one of the strongest arguments in favor of devitalization of the pulp) to obtain comfort and permanency without devitalizing the pulp.

Let us consider the question of crowns for vital teeth and crowns for non-vital teeth.

The inlay crown for vital teeth. On vital teeth it is desirable to leave as much as possible of the remaining coronal portion and at the same time give sufficient room to secure a thickness of metal that will withstand stress and constant attrition.

The axial walls of the teeth should be trimmed so that the sides are very nearly parallel, slightly tapering toward the occlusal surface. The mesial and distal surfaces are trimmed to a point about one millimeter above the gum line (Fig. 1, A and B), while the lingual and buccal surfaces are trimmed to a point about one millimeter be-



A

Fig. IV.

B

low the point of their greatest convexity, or about two mm. from the gum line (Fig. II., A and B).

The trimming is best done with vulcarbo disks, carborundum wheels, stones, and paper disks. The varying shapes and sizes in these make it possible to reach almost any angle, the contour is easily removed and at the same time the walls made parallel.

The occlusal surface is trimmed with straight edged stones until from one to two millimeters of tooth tissue is removed from the cusps. An occlusal cavity is now prepared, removing all of the grooves or fissures so as to form a complete occlusal cavity from one to two millimeters deep and with the axial walls parallel. (Fig. III., A and B.)

The object of this occlusal cavity: the closer the bulk of metal is brought to the pulp the greater likelihood of disturbance to that organ. As the horns of the pulp extend up into the cusps of the tooth it is obvious that we should not destroy the tooth at those points any more than is necessary, and then only enough to free the bite. The crown

being shorter than usual, it will require additional cementing retention, which is secured in the occlusal cavity, also deeper grooves and sulci may be carved, thus securing a more normal anatomical form. The writer has found that nearly 75 per cent. of vital teeth which he has had reasons to crown possessed cavities or fillings in their occlusal surfaces.

The preparation of non-vital teeth. The surgical and therapeutic treatment of the tooth having been properly carried out, also an X-ray examination of same, the success of the work then depends upon the mechanical preparation, which is practically the same as for vital teeth, although the occlusal cavity may be eliminated except on very short teeth requiring increased cementing retention.

When the ravages of decay have caused destruction of the remaining walls of the natural crown, some means should be adopted to build up the coronal portion and also secure permanent restoration of the root.

Such restoration can usually be best accomplished by firmly cementing screw posts (Blue Island) into the most accessible canals and then building up with amalgam to the desired length and shape.

The crown may be carried up to the gingival margin but not necessarily below it. This will necessitate the trimming and paralleling of the axial walls up to that particular point.

An impression is now taken in compound of the coronal portion of the tooth, either vital or non-vital. The compound (Kerr's) is retained in copper bands (Ransom & Randolph's); aluminum bands (Blue Island). The band should loosely fit the tooth so as to give room for excess of compound. Fill same with soft compound, chill one end and heat the other end over flame until quite soft. Press half way to place upon the tooth with rocking motion, and then with finger or thumb force up to place, chill and remove carefully.

Wrap a strip of paper or wax around the impression so as to form a cup. (The gummed edge of an envelope is most suitable.) Imbed impression into soft plaster contained in a rubber ring (piece of hose, Melott's rubber ring, etc.) just up to the edge of the paper or wax. This gives us a suitable retainer in which to pack our model material.

For the model or die material the writer prefers copper amalgam, but the following may be used: Spence's metal, Spence's plaster, Weinstein's stone, silver amalgam, zinc or copper cement, Price's stone, etc.

Having secured the model, a wire measurement is taken of same and a pure gold band of 34 gauge is constructed the same length as the measurement and about 2 millimeters wider than the greatest depth on the model. Sweat the joint to prevent stiffening by soldering. Conform the band to the general shape and outline of the model. Trim the edges to closely follow the cervical curvature. Place band upon the model and gently press to place. Burnish the excess of band at

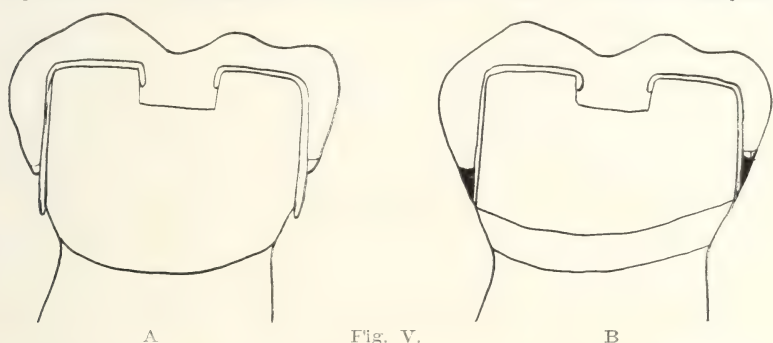
the occlusal end over upon the occlusal surface of the model. It might be necessary to make several cuts in the band in order to facilitate in the occlusal burnishing. Insert model and cap into a soft rubber block swager, and swage pure gold cap to the model. (Fig. IV., A.)

We now have a pure gold cap or inner crown upon which we can construct any form of shell crown, the advantage of which you will soon appreciate.

THE CAST SHELL CROWN.

This being one of the simplest and easiest crowns to make it will be considered first.

The pure gold cap as just described should be dried and inlay wax softened with dry heat and placed upon all surfaces, while upon the amalgam model, so as to prevent distorting it and also to get the impression of the occlusal cavity, if any. (Fig. IV., B.) Remove the cap from the model, and while the wax is in a soft state adjust to



place in the mouth, instruct the patient to close the teeth together and chew the wax. Remove from the tooth, carve the wax to normal anatomical form, place it on the tooth in the mouth again, and make any necessary corrections. Remove and cut away two millimeters of wax from around the gingival border, leaving the pure gold free at that point. (Fig. V, A.) Insert two sprue wires in opposite cups, invert heat and cast in 22-K. gold.

After casting the crown is cleaned and adjusted to the root. The pure gold margin at the gingival, which is left free, is burnished with ball burnisher to close approximity with the tooth. The crown is carefully removed and the pure gold is trimmed to gingival contour, which was produced on the walls of the tooth by grinding, and will be indicated on the pure gold from burnishing. Replace upon the tooth and burnish again, remove carefully and flow 20 or 22-K. solder upon this pure gold margin so as to produce normal continuity and strengthen same. (Fig. V., B.) The crown is then polished and ready to be cemented upon the tooth in the mouth.

ADVANTAGES OF A CAST CROWN.

- Ease in securing necessary contour.
- Ease in securing fine lines, cusps, grooves, etc.
- Ease in construction.
- It gives a maximum of metal and strength.
- No joints: it is cast in block.
- Consumes less time.

THE SHOULDER SHELL CROWN.

For any teeth that demand a shell crown the shoulder crown produces one of the best restorations and embraces the principle of a full shoulder cut into the tooth on the axial and approximal surfaces about 2 mm. from the gingival margin.

The root is trimmed as described, removing the occlusal, proximal and axial surfaces. Then with a No. 556 fissure bur cut a shoulder on the proximal surfaces about 1 millimeter occlusally from the bevel already made with stones. Small inverted carborundum stones are

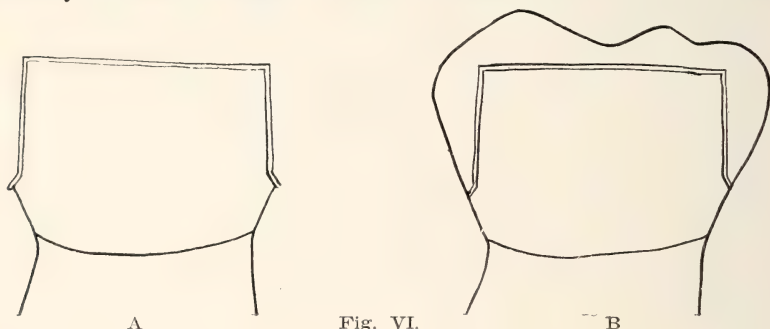


Fig. VI.

used to cut the bevel on the buccal and lingual surfaces. The groove or shoulder should be about $1\frac{1}{2}$ to 2 millimeters wide and sloping slightly toward the gingival on all surfaces, thus producing an inlay like a lapped margin.

The constructing of the crown is carried out precisely the same as the cast crown. (Fig. VI., A and B.)

THE BAND SHELL CROWN.

Crowns made by the sectional method are probably the most commonly used. They are constructed by making the band and cusps separately and subsequently uniting them or constructing a band and then casting the cusps thereon.

Method I.—Pure gold inner crown 22-K. band and swaged cusps.

After constructing the inner crown as described, construct a band same diameter as tooth of 22-K. gold, 30 gauge, and adapt over the pure gold inner crown upon the model or die of the tooth. Trim the cervical edge of the band one to two millimeters shorter than the inner

crown, thus leaving the pure gold margin for burnishing. The occlusal end of the band is cut so as to be in alignment with the occlusal surface of the model; it should also be contoured with pliers (209 Clev-Dent) in order to more perfectly meet the requirements of contact, alignment and contour. (Fig. VII., A.)

Remove the inner crown and band intact from the model, place upon a charcoal block and unite the two from the occlusal opening with small pieces of solder.

The band and cap are adjusted to the natural root, and any corrections made as to contour, etc.

An occlusal bite is taken in compound with the band and cap in place upon the tooth. Enough compound should be used to secure the imprint of at least two teeth on each side of the crown. Have the patient firmly close the jaws (see that the teeth are in direct and

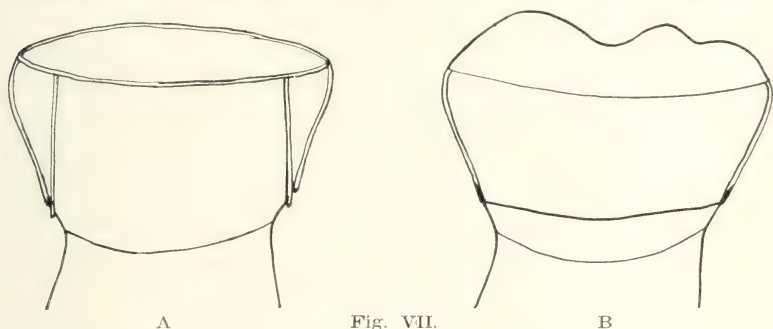


Fig. VII.

proper occlusion) and press the compound against the lingual surface of the teeth with the tongue, at the same time press it closely to the buccal surfaces with the fingers. Chill with cold water, remove from the mouth and chill again. Remove the band and cap from the tooth and place it in position in the compound; then mount securely upon the articulator. To facilitate the separation of the cap from the model the inside of the cap should be smeared with a thin coating of wax.

CUSP FORMATION.

There are many methods and systems for securing suitable cusps, and the system of stereotyped dies has no doubt predominated.

The importance of true occlusion and articulation has to be previously emphasized, and as the conditions presenting vary according to the normal accuracy of occlusion, articulation, position of the root, its relation to adjacent teeth, shape of band, depth and number of cusps required, it is fallacy to expect a ready-made cusp to meet all of these requirements.

If these requirements are to be observed, accuracy can best be obtained by forming the cusps directly from an imprint of the opposing teeth, then carving to a normal anatomical form.

When the plaster has sufficiently hardened the articulator should be opened and the compound removed. To form the cusps, plaster or a mixture of compound and graphite are employed. Flow either upon the occlusal surface of the band and cap, into which the imprint of the opposing teeth is secured by firmly closing the articulation. Carve excess of material flush with the outside of the band. Artistic effects are obtained by reproducing grooves and pits with pen-knife and wax carvers.

The cusps are removed from the band and placed upon the bench with the cusps exposed. A rubber ring is placed over same and Mel-lott's metal flown into the ring, thus securing a counter-die of the cusps. To secure a die lead buck shot is hammered into the counter-die and then trimmed about one millimeter smaller than the original cusps. This reduction in size of the lead die allows for the thickness of gold when forming the cusps.

A piece of 22-K. gold, 30 gauge, is cut somewhat larger than the diameter of the cusps to be formed (2 millimeters). This is placed upon the counter-die and the lead die on top of the gold directly over the cusp concavity in the counter-die. Place all upon an iron block and give the lead die a sharp blow with a heavy hammer 8-16 oz.; repeat until the cusps are adequately formed.

Trim off excess gold and finish flat with a fine flat file by carrying the cusps backwards and forwards over its surface. The cusp is adjusted to place on the articulator and both cusp and band filed until the edges approximate evenly and the desired occlusion is obtained and proven by closing the articulator.

During the process of soldering the relation between cusps and band should be securely sustained. This can best be accomplished by the use of specially designed pliers or the cusps may be wired to the band. Flux may also be employed to retain the correct relation by pressing the cervical end of the band into a charcoal block, flux the cusps and place upon the band in correct relation; heat slowly until the flux has completely fused. Flux a very small piece of 20 or 22-K. solder (2 mm. square) and place immediately over the joint.

In soldering, the parts should be uniformly heated. The addition of a second piece of solder the same size should be sufficient to attach the cusps of a large molar crown.

To reinforce the cusps, solder of a lower karat may be flown upon the under surface of the cusps. Place small pieces of 18-K. solder (3 mm. square) into the cusps through the opening left in the occlusal end of the pure gold inner crown, one piece in each cusp and one in the centre should be sufficient, but if desirable the cusps may be filled up in alignment with the occlusal end of the inner crown. (Fig. VII., B.)

Practically the only advantage of this method is that the cusp for-

mation may be constructed in the laboratory instead of in the mouth of the patient, thus saving time at the chair.

Method II.—Inner crown band and cast cusps.

The same details of procedure are followed in constructing the inner crown and band. The two are placed in position on the root and the occlusal end is filled with inlay wax and the teeth closed directly upon it. After chilling the wax the crown is removed, the surplus wax trimmed away even with the band and the desired shape and form given it by carving. Replace in the mouth, have patient chew upon the wax so as to secure correct occlusion and articulation, remove, make any necessary correction, insert sprues and cast the cusps in 22-K. gold.

The latter method is used in preference to the first, the advantages being: Saving of time; greater opportunities are afforded for providing normal occlusion and articulation; does not have to be trans-

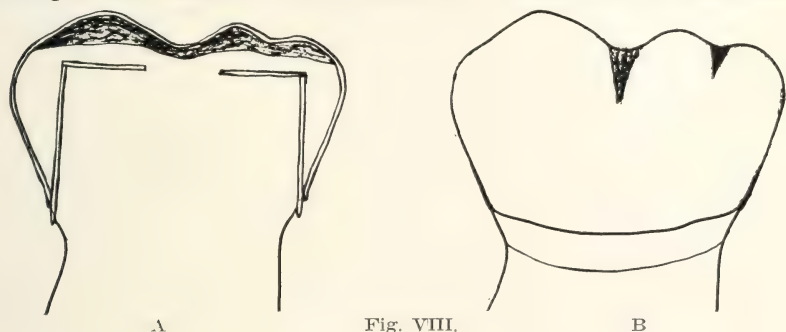


Fig. VIII.

ferred to an articulator; no dies or counter-dies are necessary; it eliminates the process of soldering, also the solder joint, and a solid cusp is formed.

The sectional crown made by either cusp method is now cleaned and adjusted to the root and the gingival pure gold margin is burished and reinforced with solder as heretofore described.

THE SEAMLESS CROWN.

The seamless method comprises forming the entire crown with one piece of gold by swaging. While many systems for this particular style of construction have been devised and are used, a close observation of the relative advantages and disadvantages as compared with the cast or sectional methods fails to afford any real or practical evidences of special merit in this process.

The advantages of the seamless crown are the absence of a solder joint, a smooth continuous surface, and the opportunities of obtaining contours.

The disadvantages are the limited selection of cusps and forms, which produces difficulty in securing normal anatomical form, cusp

formation, occlusion and articulation, also the greatest of all evils—the absence of a close adaptation of the crown to the cervical margin. A greater length of time is consumed in the process and a thinner gauge of gold.

The results from any method of procedure depend upon the skill, ability and conscientious efforts of the operator, but the real value of the seamless method will doubtless appeal more to the dental laboratories and other commercial concerns than to the average practitioner of ordinary skill and ability.

If one has become expert in the construction of the seamless crown, and is still desirous of employing it, the adaptation of the crown may be facilitated by the employment of the inner crown as heretofore described.

The pure gold cap is fitted upon the root in the mouth. The seamless crown is fitted over the cap and tested for occlusion, articulation and contact, then trimmed 2 millimeters shorter than the inner crown at the cervical. (Fig. VIII., A.) Burnish the pure gold closely to the root, remove both intact and flow solder around the cervical border as previously described.

If the cusps of the seamless crown require reinforcing this should be done before fitting same over the cap or the solder may be placed through the occlusal opening of the inner crown as described under sectional crown. (Fig. VIII., B.)

ADVANTAGES OF THE INNER OR PRIMARY CROWN.

It affords more absolute accuracy in securing adaptation and alignment. The crown is adapted closely to all the surfaces of the root, thus preventing movement and less bulk of cement to disintegrate. It is not necessary to build up teeth with amalgam in cases of small cavities, thus producing two lines of union instead of one by using the primary crown which is swaged or the gold cast into the cavity.

These advantages cause it to be accepted as one of the most successful methods.

In conclusion, the writer does not wish to impress the reader with the fact that he is exploiting the shell crown, but as long as our methods of making restorations demand anchorage, and as the shell crown is probably the one anchor that is the most extensively used by the majority of the profession, we must train ourselves to accomplish things worth while. It is not given one man to know and to do everything well, but every man should train himself to know and to do every part of one thing well, namely, the shell crown.

CUSP FORMATION.

If one is not familiar with the method of carving cusps the following suggestion might be helpful.

Review your Black's Dental Anatomy. If possible, secure a model

of natural tooth on opposite side of the arch and carve to reproduce same. The base of the grooves should be angular rather than rounded.

The buccal cusps on the lower bicuspid and molars all incline lingually, while the lingual cusps stand fairly straight. The lingual cusps on the upper bicuspid and molars incline slightly toward the buccal, and are rounded in form, while the buccal cusps are straight and pointed.

Be sure to produce the marginal ridges, contact points, all the grooves, and incline plane of the different cusps.

THE UPPER FIRST BICUSPID.

The outline of the occlusal surface when seen in a line with the

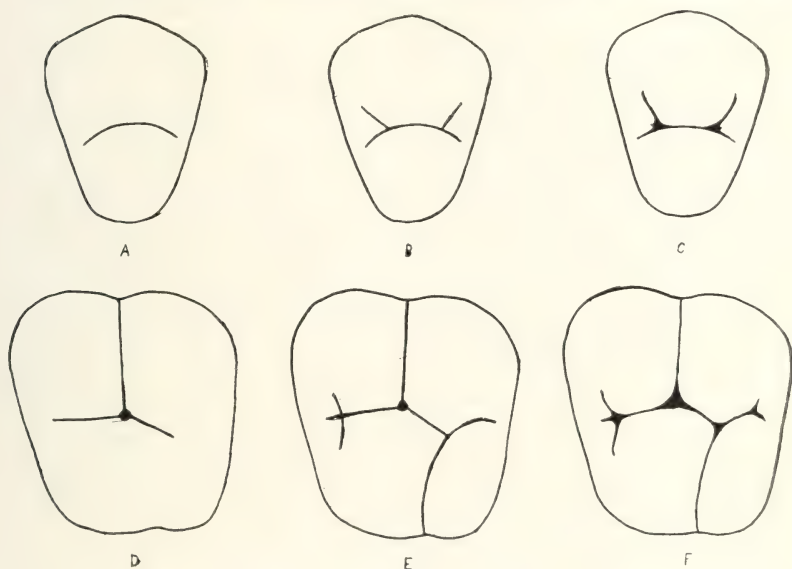


Fig. IX.

long axis of the tooth is trapezoidal or egg-shaped in form, the bucco-lingual measurement being greater than the mesia-distal, the greater mesia-distal measurement being at the point of contact.

The occlusal surface has two prominent cusps—the buccal, which is the easier of the two, and the lingual. These are transversed from mesial to distal by a deep sulcus or groove.

The first step is to form up these cusps in the wax by making quarter circular cut from mesial to distal, thus producing the central, mesial and distal grooves. Fig. IX., A. The mesial and distal grooves are really continuations of the central. The next cut will be to produce

the mesial and distal triangular grooves which run buccally and practically at right angles from the ends of the central groove, thus forming the triangular pits at the points of junction. Fig. IX., B.

Having the grooves all cut into your wax it is now very easy to form the cusps. The buccal cusp is fairly pointed, having four ridges leading away at right angles from the point of the cusp. The lingual cusp is the smaller, and is more blunt, and very frequently the central incline is a flat plane surface.

The upper second bicuspid so nearly resembles the first that to make note of its difference is not necessary.

The upper first molar. The occlusal surface presents a rhombic

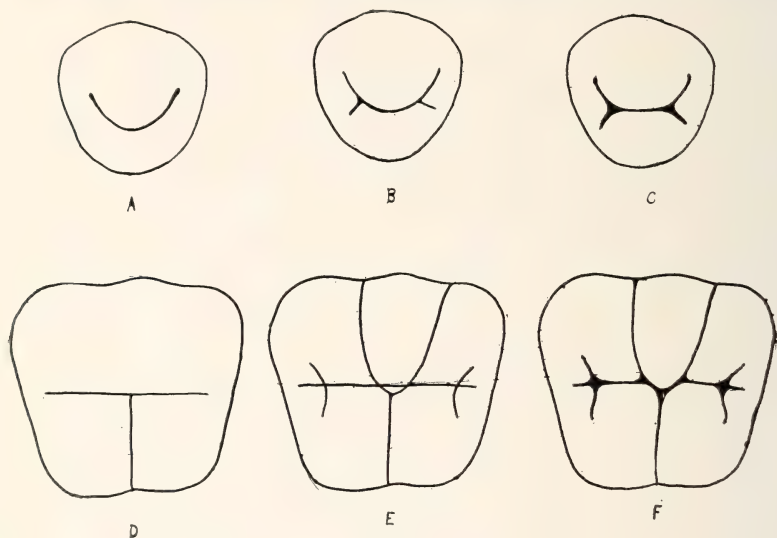


Fig. X.

form with two principal fossae and four grooves, which divide the surface into four cusps. With wax carver or pen knife establish a pit or fossae in the centre of the occlusal surface. Three grooves rise from this fossae. The buccal groove runs from this pit towards the buccal. The mesial runs from it toward the mesial and the distal toward the distal. Fig. IX., D. The remaining groove, which is the disto lingual, begins at the distal and runs in a curve to the lingual. With these grooves established as an outline, the cusps are now formed and the supplemental grooves are carved out. The two buccal cusps are fairly pointed, while the two lingual cusps are more rounded or blunt, the mesial lingual cusp being the largest and the disto lingual the smallest. Fig. IX., F.

The occlusal surface of the upper second molar is practically the same except that it is smaller and more constricted mesiodistally.

THE LOWER FIRST BICUSPID.

This tooth is the smallest of the bicuspid. Its occlusal surface presents one large buccal cusp and a lingual which are divided by the central groove, Fig. X., A, and the mesial and distal grooves, Fig. X., B. The buccal cusp is large, fairly pointed, and prominent, with its buccal surface inclined lingually. The lingual cusp is very short and practically a ridge. Fig. X., C.

The lower first molar. The outline of the occlusal surface is trapezoidal, with the greatest width toward the buccal at the points of contact. It presents five cusps, three on the buccal and two on the lingual, also five grooves, two toward the buccal, one to the lingual and a mesial and distal.

First establish the groove from mesial to distal, then the centre of

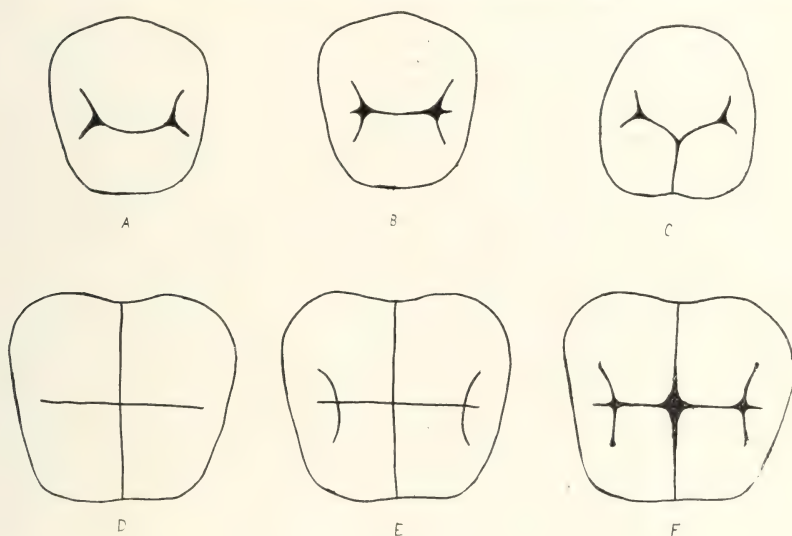


Fig. XI.

the occlusal surface, then from the centre of this groove produce your lingual groove running through to the lingual surface. Fig. D.

To produce the buccal groove start at a point about one millimeter mesially from the centre of the buccal surface, produce a groove and central incline is practically a flat plane. Fig. X., F.

The disto buccal groove is started at a point midway between the buccal groove and the distal surface and carried lingually to meet at the same point of junction, thus forming the central fossae. Fig. X., E.

The three buccal cusps are rounded with their buccal surfaces inclined lingually. The buccal cusp is the largest, while the disto buccal and the distal are practically the same size.

The two lingual cusps are equal in size and fairly pointed, but their central incline is practically a flat plane. Fig. X., F.

THE LOWER SECOND BICUSPID.

The occlusal surface is regular in outline form, but the grooves are much diversified. Their differences may be classified under three forms, the grooves being in the forms of the letters U, G, H and Y. Fig. XI., A, B, C.

The buccal cusp is blunt, with the buccal surface sloping toward the lingual. In the first two classes the lingual cusp is much larger than the first bicuspid. The third class, or three cusped forms, the two lingual cusps are usually a little broader than the buccal portion of the tooth. The central incline on these cusps is also a flat plane.

The lower second molar. The most characteristic difference of the occlusal surface between the lower first and second molars is the absence of the fifth cusp (distal) in the second; and the general change of form which this absence implies.

The occlusal surface has four cusps and four grooves. The mesial distal, buccal and lingual, which take the form of the letter X. Fig. XI., D, E, F.

Royal College of Dental Surgeons of Ontario Annual Meeting

THE Board of Directors of the Royal College of Dental Surgeons held their annual meeting during the week, 12th to 17th May, 1919. Reports for the year showed remarkable progress in every department of the College, and it was decided to proceed immediately with the erection of an addition to the present college building. The extension will provide additional laboratories, large amphitheatre, and surgical clinic room. The present Infirmary will also be extended considerably, and a new chemical laboratory will be equipped in the most modern way.

The Board is composed of the following: President—Dr. W. M. McGuire, Simcoe; Vice-President—Dr. A. M. Morrison, Peterboro; Registrar—Dr. A. D. A. Mason, Toronto. Dr. H. R. Abbott, London; Dr. E. E. Bruce, Kincardine; Dr. R. H. Cowen, Hamilton; Major W. R. Greene, Ottawa; Dr. R. Gordon McLean, Toronto.

The College is unique in its organization and democratic control through the Dental profession. Upon graduation every student becomes a member of the College, and as such enjoys an equal interest with every other licentiate and upon payment of the annual fee is entitled to vote in the selection of District Representative. The history

of the R.C.D.S. dates from the time of the Canadian Confederation, and the College has enjoyed a most remarkable and successful career. The great men of Dentistry's past have certainly handed down to the present generation of Ontario Dentists a wonderful heritage, and it is for the profession to administer this great public trust in the interests of Public Health, Dental Science, and Education.

There were registered during the past session the following students:

	Women.	Men.	Total.
Freshmen	6	137	143
Sophomore	3	117	120
Junior	—	133	133
Senior	—	88	88
	<hr/> 9	<hr/> 475	<hr/> 484
Graduates in Arts			4
Graduate in Applied Science			1
Students from Province of Ontario			426
Students from Eastern Provinces			9
Students from Western Provinces			48
Student from India			1

REGISTRATION OF GRADUATE DENTISTS.

The Board decided that Dentists who are graduates of a recognized dental college and matriculants of the R.C.D.S., would hereafter be admitted to examination without attending the final session of the School of Dentistry of the R.C.D.S. Special provision was made for citizens of Ontario, non-matriculants of the R.C.D.S., and graduates of recognized colleges, enabling them, after four years of practise, to take an examination embracing only the subjects of the final year of the R.C.D.S.

RELATIONS WITH UNIVERSITY AND GOVERNMENT.

The Committee on Relations with the University and Government reported as follows:

"At a special meeting of the Board of Directors, held on the 28th of February, 1919, the President reported that the Committee appointed by the Board at its previous meeting had a conference with the President of the University on November 11th, 1918. At his suggestion the Committee met the Board of Governors on February 27th, 1919. After considerable discussion the University Governors stated that they would appoint a small Committee to meet with the R.C.D.S. Committee, when a definite budget scheme might be considered.

"Your Committee was instructed by this Board to make a draft of the whole scheme, and to submit same at the Annual Meeting.

"In connection with the application by the R.C.D.S. for a grant from the Ontario Government, the whole question of the relationship of this College to the Government and to the University of Toronto was raised, and the Provincial Government now has under consideration the whole question of educational activities within the Province.

"The following letter has been received from the Prime Minister:

"Dr. Wallace Seccombe,

"Supt. Royal College of Dental Surgeons,

"240 College Street, Toronto.

"My Dear Dr. Seccombe:

"In further reference to our correspondence, during the Session, on the subject of the Dental College, I beg to say that I have had a long consultation with the Minister of Education on the subject.

"I quite recognize the growing importance of the Dental profession and the necessity of maintaining it at a high standard in this Province, and affording the best possible opportunity for education and training to those entering its ranks. In the rush of the work of the Session I was not able to give the subject the full thought and attention its importance deserves. I have, however, since the Session, been giving further thought to the subject. I am leaving the city to-day and will not be back for a fortnight. On my return I would be glad to give the matter further attention and to listen to any representations you may desire to make. I have no doubt that in the meantime it will not be necessary to take any action that will interfere with carrying into effect any policy that we might agree upon.

"With kindest personal regards and best wishes for yourself and the important profession with which you are connected, I am,

"Yours sincerely,

"(Signed) W. H. HEARST."

"In view of this correspondence your Committee would suggest that no further action be taken pending the decision of the Government as to its policy in these matters.

"Respectfully submitted,

"W. M. MCGUIRE,

"H. R. ABBOTT,

"A. E. WEBSTER,

"W. E. WILLMOTT,

"A. D. A. MASON,

"W. SECCOMBE,

"Committee."

REPORT OF MILITARY COMMITTEE OF THE BOARD.

The C.A.D.C. Committee reported as follows:

"During the past year your Committee has undertaken important work in connection with Military Dental Service, in so far as it was

possible for a Committee of Civilians to be of assistance. Your Committee included the Soldiers' Civil Re-Establishment within its field of activity.

POST GRADUATE COURSE IN WAR SURGERY.
ANESTHESIA AND PROSTHESIS.

"During the progress of the war and subsequent to the return of Lieut.-Col. Hume and the development of War Prosthesis by Major Cummer, your Committee decided to conduct a Post Graduate Course and invite a limited number of officers of the C.A.D.C. as guests. It was further decided that civilians should be charged a fee of \$50, and the entire profit divided between the teachers.

"Your Committee received a suggestion from the President of the Preparedness League of American Dentists, that the League would be glad to co-operate in such a Course. It was thereupon decided to make the Course international in character, and the League was invited to nominate two American teachers, who along with Col. Hume and Major Cummer would form the Faculty. The teachers, chosen by the Preparedness League, were Drs. Arthur E. Smith, Chicago, and Leroy S. Miner, Boston.

"The Course was held in the College Building from Monday, 16th December, to Saturday, 21st December, 1918, and was an unqualified success. Delegates were present to the number of 95, and included dental practitioners from every part of United States and Canada.

"A very interesting little brochure was prepared containing the names of the Faculty, the Committee, group photograph of the Class, and a list of the Registrants with their home addresses. A copy was sent to each member of the Class.

"The Committee added Dr. H. R. Abbott to its number, for the purpose of this Course, to assist the Committee as chairman of one of the study groups.

SOLDIERS' CIVIL RE-ESTABLISHMENT.

"The S.C.R. recently appointed a Director of Medical Services, and placed this officer in complete charge of all Dental treatment affecting the work of the Department. Your Committee determined to make a vigorous protest against such an arrangement, and urged the organization and administration of a Dental Service in the S.C.R. as a distinct unit. It was clearly recognized by your Committee that a satisfactory adjustment of this question was vital to the present relationship of the Canadian Army Dental Corps to certain other Militia units.

"Drs. McGuire and Seccombe were appointed to arrange an interview with Senator Loughheed, Minister in charge S.C.R., and lay the views of the Dental profession before him. The members named

met Sir James in the Senate, Ottawa, on 6th March, 1919, and subsequently discussed the whole matter with Lieut.-Col. F. McKelvey Bell, Director of Medical Services, S.C.R. Efforts of other members of the profession, along with those of your Committee, have resulted in the appointment of Lieut.-Col. Corrigan, D.S.O., as Director of Dental Services, S.C.R. Your Committee would suggest that the board, by resolution, express its approval of this action and forward the same to Senator Lougheed, along with the thanks of this Board for his interest and prompt action.

"The Board will doubtless be glad to learn that the Department of Education, Province of Ontario, has also recognized the principle of an independent dental service, in its organization of a Provincial School Health Service, by having the Dental Officer report (as does the Medical Officer) direct to the Chief Inspector of Schools. This action upon the part of the Provincial authorities will encourage the establishment and administration of local dental clinics upon a basis satisfactory to the Dentists of the Province, and will eliminate the weakness and difficulties that would arise were Dental officers required to report to Medical officers.

POST GRADUATE COURSE FOR RETURNED DENTISTS.

"Your Committee has given a great deal of consideration to the pressing need of a Post Graduate Course for Canadian Dental Practitioners, following their discharge from military duties. These men, whether having served in a combatant, or other unit, would certainly appreciate the opportunity of taking a short Post Graduate Course.

"We have corresponded with those in charge of the Canadian Army Dental Corps, both in Canada and overseas, as well as with individual officers, and have received many suggestions regarding both the most suitable time and the subjects to be included in such a Course. The whole matter, however, has been held, pending the decision of this Board as to whether such a Course should be conducted. For the purpose of bringing the question before the Board in concrete form, your Committee beg to recommend as follows:

"*First*—That the C.A.D.C. Committee proceed with the arrangements for a Post Graduate Course for returned Canadian Dentists.

"*Second*—That the Course be held during September, 1919, previous to the opening of the College Session, to continue for one week, or more.

"*Third*—That Registrants be permitted to remain after the opening of the session, should they so desire, and attend the clinical sessions of the College Infirmary.

"*Fourth*—That the Committee learn the desires of the officers themselves as to what subjects the Course should embrace.

"*Fifth*—That the Course be confined to C. E. F. men and that no fee be charged.

"Sixth—That the Board place at the disposal of the Committee an appropriation of \$500.00 to defray the expenses of the Course.

"All of which is respectfully submitted,

"HAROLD CLARK, *Chairman*.

"W. M. MCGUIRE,

"F. J. CONBOY,

"WALLACE SECCOMBE, *Secretary*,

"240 College St., Toronto."

The report of the Committee was adopted. Dentists who have served in the C.E.F., and who desire to attend, should send in their names at once, with suggestions regarding the course of study to be followed.

COURSE OF TRAINING FOR DENTAL NURSES.

An advance step was taken in the decision to conduct, commencing session 1919-20, a course of training for dental nurses. The Report of the Committee was adopted and is as follows:

"The Committee having given consideration to the question of establishing a course of training for dental nurses, and having had the advantage of suggestions from the Faculty Council, begs to recommend that such a course of training be established commencing Session 1919-20.

"Your Committee would suggest the following as a suitable basis for the organization of such a course:

"Course to be given in the Royal College of Dental Surgeons, and to be known as The Training School for Dental Nurses.

"The purpose of the Course shall be:

"First—To train young women for service to both dentist and patient in the practice of dentistry.

"Second—To prepare them for public service, to act in the capacity of assistants to Dentists engaged in school and hospital dental service.

"Requirements of Admission.

"Applicants to be approved by the Registration Committee of the Royal College of Dental Surgeons of Ontario.

"Course. (a) Length of Course.

"The Course shall embrace seven months' instruction and shall be divided into two semesters:

(b). *Subjects of Course.*

"The tooth brush and its use.

"Office routine and management.

"Records, banking and correspondence.

"Assisting at Dental chair.

"Knowledge and care of instruments, materials and equipment.

"Assisting with anesthetics.

"Preparation of drugs for dental use.

"Sterilization and sanitation.

"Elementary pathological laboratory technique.

"Elementary prosthetic laboratory technique.

"Radiography.

"Ethics and conduct.

"School and hospital dental service.

"The Registration Committee at their discretion may admit experienced dental assistance to the second semester.

"Fees.

"Registration Fee, \$10.00.

"Tuition Fee, \$20.00 each semester.

"The Committee would suggest that the Board limit the first class to 15 members, for which number the Building Committee is making provision.

"That the Course include not more than 75 lecture hours; the Faculty Council to determine the number of hours and staff in each subject. Remuneration to be provided for lecture hours only, and to be at regular schedule rate.

"Each candidate who successfully completes the Course shall be awarded a certificate, and shall be known as a 'Dental Nurse.'

"Respectfully submitted,

"R. GORDON McLEAN,

"A. E. WEBSTER,

"A. D. A. MASON,

"WALLACE SECCOMBE,

"Committee."

It will be noticed that the Dental nurse will act entirely as an assistant, and will not be trained or permitted to practise as a "hygienist."

* * * * *

The Board and Profession in Ontario are to be congratulated upon the progress that has been made during the past twelve months. The College has had the most successful year financially in the history of the R.C.D.S., and may take justifiable pride in having passed through the war years in such a creditable manner.

Announcement In Canadian House of Commons Regarding Dental Service, Department of Soldiers' Civil Re-establishment

ELSEWHERE in this issue is reported the appointment of Lieut.-Col. C. A. Corrigan, D.S.O., as Director of Dental Services, S.C.R., Ottawa. In Hansard of Friday, May 23rd, 1919, an interesting discussion is reported as having occurred upon the floor of the House of Commons during the voting of supply to the Department

of Soldiers' Civil Re-establishment. The accompanying excerpts from the official report will doubtless prove of special interest to the Dental profession. It is most gratifying to know that Dentistry is being recognized officially as an important and distinct branch of the Science of Health, and is being organized and administered as such in the interests of efficient service.

The Dental profession is also to be congratulated upon the fact that one of its most energetic and honored members is a member of the Federal House. Major W. D. Cowan, M.P., of Regina, Sask., has already accomplished much in the interests of good citizenship, and has also found time to render splendid service to his own profession as a member of Parliament, Secretary-Treasurer of the Dominion Dental Council, and as an officer in the Canadian Army Dental Corps.

The Excerpts from Hansard follow:

Mr. Lemieux—Has the dental corps been transferred from the Militia department to this new department?

Mr. Rowell—No.

Mr. Lemieux—I understand that a decision had been arrived at some time ago.

Mr. Rowell—The Militia department has not transferred the Dental Corps to the Soldiers' Civil Re-Establishment department. The Militia department is treating the returned soldiers who require dental treatment immediately upon discharge, but the Soldiers' Civil Re-Establishment department must necessarily provide dental treatment for those who come under its charge and establish its own branch for this particular work.

Mr. Cowan—Do I understand that the cost of dental services is provided for under this vote?

Mr. Rowell—No, this relates only to buildings.

* * * * *

Mr. Cowan—I think this is the proper item on which to discuss the dental service of this department. The minister announced very briefly this afternoon that he had decided to establish a dental service as distinct from the Canadian Army Dental Corps. The minister probably will not thank me for trying to make an announcement on his behalf, but as I happened to be, and have been for the last thirty-five years a dental surgeon, also assistant director of the Canadian Army Dental Service in military district No. 12 since that district was first formed, he will probably pardon me for making a few observations. In the first place, I approve most heartily of the course he is pursuing in establishing this separate dental service for the department. It may be asked why a separate service is necessary when the Canadian Army is in existence. That leads me to make a few observations.

As I see it, the Canadian Army Dental Corps has given to Canada

a very satisfactory service. We have set a pace for the world. We have established a service that was unknown to us heretofore, and I think we have to thank probably the Minister of Militia and Defence for the advance made in that regard. The Canadian Army Dental Corps has given to Canada a distinct and a new place in dentistry. Heretofore Canadian dentistry has been submerged, so to speak, under American dentistry; we had no distinct place of our own. It is due to the fact that we established this corps, and the further fact that it has given such magnificent service overseas, that Canada is recognized as occupying a distinct place in the dental world to-day.

* * * * *

I suppose it will be asked why it was necessary to create a separate service. I approve most heartily of the step, because just as it would be inadvisable to put a dentist in control of the Army Medical Corps, it is equally inadvisable to put a medical man in control of the Dental Service. The two are distinct professions. We dentists have always felt that we had the business ability to handle satisfactorily our own affairs, and the record of the Canadian Army Dental Corps in this war has proved that ability conclusively. The corps has not caused any trouble at all, I am satisfied, to the Militia department; it has served, and served well, and at salaries much lower than could have been earned in civilian practice.

Mr. Lemieux—The transfer has not been made yet?

Mr. Cowan—The minister this afternoon announced that he was going to establish that service. I have every reason to believe that the Canadian Army Dental Corps is to be continued for service to the Militia Department, and that this new branch is to be used in the service of the Department of Soldiers' Civil Re-Establishment.

Mr. Rowell—I think my hon. friend understood me, but perhaps some other hon. members did not. The Department of Soldiers' Civil Re-establishment is not taking over the Dental Corps, but is establishing a branch for treating the ex-members of the forces coming under its care.

Major-General Mewburn—We felt that during demobilization we could not disband the dental service. A very large number of men are coming back from overseas or are here already, some thirty thousand, who will require further dental treatment. Many of them are suffering from trench mouth and other mouth diseases, and it would be manifestly unfair not to give them treatment. At first we thought it could be done in connection with the Department of Soldiers' Civil Re-Establishment, but that was not considered feasible. So after consultation, we decided to continue the Dental Service during the period of demobilization, so that the men requiring treatment could get it.

Mr. Cowan—I approve most thoroughly of the course which is being followed by both departments in connection with the dental service.

In the position I occupied in Military District No. 12, it was my duty and opportunity to observe conditions, and I know something of them. Many of the men are coming back from overseas in a most deplorable condition, dentally speaking. The conditions under which they have been living for the last two or three years have brought about a dental condition which is very, very difficult to deal with to day, and the minister is absolutely right when he says that they should receive the necessary dental treatment until they are at least in the condition in which they were when they enlisted.

* * * * *

It will take a considerable time for the Dental Corps as now established to finish up their work in connection with the Militia department. It cannot be done in the time which was first specified, namely, sixty days after discharge; that is absolutely impossible. It would have been equally impossible if the Corps had been demobilized as at first proposed, to attend to these men in our hospitals because they are already occupied by patients who require quietness more or less. Further, it would be utterly impossible for as satisfactory a service to be given in the hospitals, because the treatment is entirely different from that of the Dental Corps. For these reasons it was found advisable not to demobilize the Corps, and I approve as strongly as I can of the course which is being pursued.

Mr. J. H. Sinclair—Who appoints the doctors and the dentists?

Mr. Rowell—The doctors would be selected by the Director of the Medical Service, and the dentists by the Director of the Dental Service.

The Canadian Dental Research Foundation

An Appeal to the Members of the Dental Profession of Canada

THE Canadian Dental Research Foundation has issued an appeal to Canadian dentists to liberally support a memorial fund in honor and recognition of the service and sacrifice of Canadian dentists in the great cause, to take the form of a permanent Endowment fund for dental research. An interesting brochure has been prepared containing the following information:

To the Members of the Dental Profession of Canada.
Fellow Practitioners:

How can we best show our appreciation of Dentistry's large contribution toward the winning of the war? How are we, as a profession, to honor those of our number who sacrificed everything at their country's call? There is surely *no more fitting way to honor these men than to establish a Permanent Foundation for Dental Research within the Dominion of Canada.*

THE PRESSING NEED.

CLINICAL EXPERIENCE PLUS SCIENTIFIC RESEARCH.

Most of the knowledge that underlies Dental Practice up to the present, is the outcome of clinical experience and observation, much of it empirical and often inaccurate. Not only the professional but the commercial world to-day is relying more and more upon laboratory methods for the acquirement of new knowledge upon which to base practice. The greatest needs of the Dental Practitioner for the future must be met through channels of Scientific Research. Very little of this can be done by the busy dentist. It requires the undivided time of men specially gifted and specially trained for the work.

THE DUTY OF THE DENTAL PROFESSION OF CANADA.

Dentistry has a place of growing importance in the Science of Health, and this growth lays increasing responsibility on the Profession. The recent achievements of dentistry, both in general practice and in Army Dental service, have been so significant that the attention and esteem of the general public are turned more and more in the direction of the dentist. It is for the Dental Profession of Canada to assume the responsibility of a Department of Research. Every dentist must realize that very little of his professional knowledge and ability to practise is the outcome of his own genius. They have been a gift to him from the splendid men of our profession, present and past, who have always, in true loyalty to scientific ideals, presented to their fellows, as a free-will offering, their valuable ideas and discoveries as soon as conceived. Every worthy dentist will welcome an opportunity to support a Canadian Dental Research Organization. The Profession in the United States has for years endowed and supported the Dental Research Institute in Cleveland. Canada cannot afford to be behind in this important work.

UNSOLVED PROBLEMS.

There are many problems demanding attention that daily remind the practising dentist of his need for scientific instruction and assistance.

The Foundation plans to work along lines that will be of practical advantage to the dentists of Canada. Work is being carried on, or planned, in the following important problems: Relation of diet to dental disease; root canal technique; chemistry of the saliva; bacteriological studies in gingivitis; tissue changes in dental foci of infection; operative and prosthetic problems, all having a direct bearing upon daily practise.

Subscribers to the Foundation will receive Bulletins, from time to time, covering approved technique of practical office problems, for example: Sterilization, Root Canal Operations, Casting Technique, Cavity Preparation. Subscribers may also, upon request, secure spe-

cial reports, covering any difficult problem where clinical advice, or laboratory report, is desired.

MEMORIAL ENDOWMENT FUND.

It is felt that this work must be undertaken by the Profession of Canada at once, and to this end it is proposed that a Memorial Endowment Fund be established, the income from which is to be devoted to the support of original research in difficult dental problems.

THE OBJECTIVE.

The trying times of the past four years have demonstrated that in public spiritedness the dental profession of Canada has been unsurpassed. Members of the profession will only have to be convinced that this important undertaking is to be well and properly conducted to give it generous support.

WHAT IS MY FAIR SHARE?

It is proposed to ask from the Dentists \$50,000, and to secure an equal sum from public-spirited men of means among the laity. This means that each dentist will be asked to contribute at least *one per cent. of his gross earnings for one year* to this worthy undertaking. This is simply a suggestion offered by the Committee as a suitable guide to those of the profession, who ask the question "What is My Fair Share?"

The Students of the Royal College of Dental Surgeons undertook to raise a sum of money for this fund. Practically every student contributed, and there was raised, within the College walls, a total of \$1,500.00.

The growth of public esteem enjoyed by the profession, during the war years, is a most valuable asset, and to maintain this esteem every Canadian dentist must have a worthy part in this undertaking.

PLAN OF ORGANIZATION AND TERMS OF TRUST.

The Canadian Dental Research Foundation is the Official Organization of the Dental Profession for Research. All funds received by this Committee will be placed to the credit of the

CANADIAN DENTAL RESEARCH FOUNDATION.

The plan of organization is that adopted by the Canadian Dental Association at the meeting held in 1918 and provides for Provincial Research Committees to be appointed from time to time by the official Board of each of the Provinces of Canada.

The Chairman and one other member of each Provincial Committee shall be Directors of The Canadian Dental Research Foundation. This Board shall meet at the time and place of the Canadian Dental Association and shall hold office until their successors are appointed.

The Board will direct the expenditure of funds or apportion the same among one or more of the provincial Committees, to be devoted to the purposes for which the fund was established.

TERMS OF TRUST.

The monies subscribed will be paid in to the National Trust Company, Trustee, who will invest them on behalf of and in accordance with the instructions of The Canadian Dental Research Foundation in securities in which Trustees are for the time being authorized to invest trust monies, and will pay the net annual income to the said Research Foundation.

For purposes of security and permanence, The Canadian Dental Research Foundation has become an incorporated body.

EXECUTIVE OFFICERS, 1918-1920.

President—R. GORDON McLEAN.

Hon. Treasurer—MAJOR W. E. CUMMER.

Hon. Secretary—WALLACE SECCOMBE.

240 College Street, Toronto.

The dentists of Canada are urged to make prompt response to this appeal. All subscriptions and cheques are to be sent direct to The Canadian Dental Research Foundation, 240 College St., Toronto; cheques to be made payable to the National Trust Company. Subscriptions will be acknowledged through the Canadian Dental Journals (unless otherwise requested) and will be grouped by Provinces.

The official Board of each Province is urged to appoint their Provincial Committee, that every section of Canada may be represented and united in this great national movement. The honor of sending in the first subscription from a point outside the province of Ontario goes to a graduate of Laval, practising in the Province of Saskatchewan. This is a *big thing* that must be done in a *big way*, and success will only be achieved through graduates of every college and practitioners of every province doing their very best. "At least one per cent. of his gross earnings for one year" will be the objective of every man who desires to bear his "fair share."

Federal Department of Health

ON March 26, Hon. N. W. Rowell, President of the Privy Council, introduced into the House of Commons a Bill to establish a Dominion Department of Health.

The introduction of this Bill is the culmination of a movement initiated at the Public Health Conference of the Commission of Conservation in October, 1910, and of many recommendations to the Government by various bodies interested in public welfare.

As will be seen from the text of the Bill herewith, the proposed Department of Public Health is given wide scope as detailed in section 4, "The duties and powers of the Minister shall extend to and include all matters and questions relating to the *promotion and preservation of the health* of the people of Canada over which the Parliament of Canada has jurisdiction."

The Act as passed by the House of Commons on April 11, is as follows:

AN ACT RESPECTING THE DEPARTMENT OF HEALTH.

His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:

1. This Act may be cited as *The Department of Health Act*.
2. There shall be a Department of the Government of Canada which shall be called "The Department of Health," over which a Minister of the Crown to be named by the Governor in Council shall preside.
3. (1) The Governor in Council may appoint an officer, who shall be called "the Deputy Minister of Health," who shall be the deputy head of the Department and who shall hold office during pleasure.
(2) Such other officers, clerks and employees as are necessary for the proper conduct of the business of the Department may be appointed in accordance with the provisions of *The Civil Service Act*, 1918, and of any Acts in amendment thereof, all of whom shall hold office during pleasure.
- (3) The Governor in Council may, subject to the provisions of *The Civil Service Act*, 1918, or any amendment thereto, transfer to the Department of Health any officer, clerk or employee now in the employ of His Majesty or of either or both Houses of Parliament, and subsection two of section seventeen of the said Act shall not apply to such transfers, and the money voted by Parliament for the financial year ending the thirty-first day of March, one thousand nine hundred and twenty, applicable to the payment of the salary or the increase of salary of any such officer, clerk or employee so transferred shall be available for the payment of his salary or increase of salary or the salary of any person appointed in his place in case of his death, retirement or dismissal while serving in the Department of Health, in the same manner and to the same extent as if such officer, clerk or employee had not been so transferred.
4. The duties and powers of the Minister administering the Department of Health shall extend to and include all matters and questions relating to the promotion or preservation of the health of the people of Canada over which the Parliament of Canada has juris-

diction; and, without restricting the generality of the foregoing, particularly the following matters and subjects:

- (a) Co-operation with the provincial, territorial, and other health authorities with a view to the co-ordination of the efforts proposed or made for preserving and improving the public health and the promotion of child welfare;
- (b) The establishment and maintenance of a national laboratory for public health and research work;
- (c) The inspection and medical care of immigrants and seamen, and the administration of Marine Hospitals;
- (d) The supervision, as regards the public health, of railways, boats, ships and all methods of transportation;
- (e) The supervision of Federal public buildings and offices with a view to conserving and promoting the health of the Civil Servants and other Government employees therein;
- (f) The enforcement of any rules or regulations made by the International Joint Commission, promulgated pursuant to the treaty between the United States of America and His Majesty relating to boundary waters and questions arising between the United States of America and Canada, so far as the same relate to public health;
- (g) The administration of the statutes mentioned in the Schedule to this Act, and of Acts amending the same, and also of all orders and regulations passed or made under any of the said Acts; and all the duties and powers of any Minister of the Crown under either of the said Acts or any of the said orders or regulations, are hereby transferred to and conferred upon the Minister of Health;
- (h) Subject to the provisions of *The Statistics Act*, the collection, publication and distribution of information relating to the public health, improved sanitation, and the social and industrial conditions affecting the health and lives of the people;
- (i) Such other matters as may be referred to the Department by the Governor in Council.

5. The Governor in Council shall have power to make such regulations as may be necessary to give effect to and carry out the objects of this Act, and to impose penalties for any violation of such regulations.

6. There shall be a Dominion Council of Health consisting of the Deputy Minister of Health, who shall be chairman, the chief executive officer of the Provincial Department or Board of Health of each Province, and such other persons, not to exceed five in number, as may be appointed by the Governor in Council, who shall hold office for three years. The Dominion Council shall meet at such times and places as

the Minister may direct, and shall be charged with such duties and powers as the Governor in Council may prescribe.

7. Nothing in this Act or in any regulation made thereunder shall authorize the Minister or any officer of the department to exercise any jurisdiction or control over any Provincial or Municipal Board of Health or other health authority operating under the laws of any province.

8. The Minister shall annually lay before Parliament, within fifteen days after the meeting thereof, a report and statement of the transactions and affairs of the Department during the year then next preceding.

SCHEDULE.

REVISED STATUTES OF CANADA 1906.

	Chapter.
The Quarantine Act	74
The Adulteration Act	133
The Public Works Health Act	135
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The Canada Shipping Act, Secs. 406, 407 and 408	113

STATUTES OF 1908.

The Proprietary or Patent Medicines Act.....	56
The Acts in amendment of any of the foregoing Acts.	

* * * *

There is a large field awaiting the activities of the new department, and, under the policy of reconstruction initiated by the Government, much that will be of benefit to Canada as a whole may be expected.

TIGHTENING THE LID OF A VULCANIZER.—The rubber ring of the vulcanizer is sprinkled with powdered meersham, the lid replaced, and the screw tightened, at first lightly, then more firmly as the boiling point is reached.

RADIOGRAPHY.—As radiography in dentistry is comparatively a new science and is as yet in the development stage, it naturally follows that much which is said or written about it will be more or less speculative as to its definite value. Thus we find a mass of literature in our journals upon this subject which deals almost altogether with individual opinion and not with definite substantiated knowledge as to just what pathology is or is not shown upon an X-ray film. In looking over these writings, which emanate from both the medical and dental professions, one finds that the present status of radiography seems to be as a "more or less valuable aid" in diagnosis, but not positive enough in all its findings to be relied upon entirely for that purpose.—*Dental Review*.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

HAEMORRHAGE AFTER EXTRACTION.

SOME very unusual cases of hæmorrhage after the extraction of teeth have been reported in our dental journals, but few of them are as interesting as the one cited by Dr. F. N. Beam in a recent issue of "Items of Interest." The patient, a man of about twenty-eight years of age, was, as it was found out later, from a family of bleeders although no others of his immediate family showed any signs of hæmophilia. His mother's brother died at the age of twelve from hæmorrhage following a slight cut on the face. One of his mother's male cousins was a bleeder, also her father. Indeed many of the males of his mother's family were subject to this condition and it could be traced back for centuries. The patient himself had suffered severely at the age of twelve, following the extraction of a tooth and during his entire life he had been troubled with frequent bleeding from the nose.

When the patient went to the dentist for treatment he related his earlier experience with an extracted tooth, but thought that there might not be any more trouble owing to his better physical condition. With this view the dentist agreed. Several roots were then removed. After the extraction of the first root, the operator waited for the bleeding to stop, which it did promptly. The other extractions were then gone on with and all bleeding ceased within five minutes. So far then, everything pointed to normal conditions—an estimate that was rudely upset by subsequent events.

About six hours after the roots had been extracted, the patient came back complaining of severe bleeding from all the sockets. This had been going on continuously since he left the office. Adrenalin tape was packed into the sockets and the bleeding stopped. In a little while the hæmorrhage was renewed. Indeed, it would break out anew if the patient simply lowered his head. This time adrenalin chloride and cotton were used but the blood flow was as copious as ever. By packing cotton saturated with adrenalin chloride tightly

into the sockets the hæmorrhage could be controlled for a few minutes only. Repeated trials of this method soon demonstrated its ineffectiveness and other means had to be sought.

The patient was put in bed, in a semi-recumbent position and the head placed in an ice-pack. Numerous applications of all the more common styptics failed to bring about any satisfactory results even when these were used to supplement the ice-pack treatment. As an internal treatment, calcium chloride 80 gr., potassium iodide 30 gr., and thyroid gland 15 gr. each were used daily but the hæmorrhage could only be controlled for a few hours. Diphtheria serum was administered subcutaneously but with no good effect.

Five days after the teeth were extracted the blood flow was un-stopped and the patient was very weak. The blood count at this time showed: Red, 2,110,140; white, 3,600; hæmoglobin, 20 per cent. His blood after standing one hour and a half formed only a soft clot. After many other methods had been resorted to without avail the actual cautery was brought into use. The sockets were cauterized to a cinder before the bleeding could be stopped. It now looked as though success would now attend the operator's efforts, but again there was disappointment. Some forty-eight hours later the eschar sloughed away and the bleeding began again, this time from the tissues surrounding the sockets. There did not appear to be any hæmorrhage from within the sockets but the blood oozed through the gum tissues around the sockets, and about the roots of teeth that had not been interfered with in any way whatever. Diphtheria antitoxin (120 c.c.) was again resorted to, being this time injected intravenously but with no good results.

Owing to the patient's weakened condition it was thought best to resort to the use of pure fresh horse serum. Dr. Beam describes the method used as follows: "A sound young three-year-old horse was selected from which was extracted a quart of blood. It was then defibrinated and centrifugalized and put on ice for twenty-four hours; 120 c.c. of this serum was injected intravenously through the medium basilic vein. The patient suffered much shock during the latter part of the injection. Hæmorrhage stopped inside of five hours; temperature at that time was 101 deg. F., pulse 120, respiration 22. Patient developed a severe urticaria over the entire body twelve hours after injecting the serum; for fear of further hæmorrhage 30 c.c. of the same serum was given in the same manner forty-eight hours after the first injection. Patient was kept in bed for a week longer, when he had regained sufficient strength to resume his work."

An interesting feature in connection with this case is that when the sequestrum formed, as the result of having used the cautery, it sloughed out and was removed by the patient himself without causing any hæmorrhage at all.



Three Men

IN a previous issue of *Oral Health* I had an article entitled "Two Men." This one is on "Three Men." The other was impersonal—this is personal. It is inspired by the recent announcement of the death of my dear old teacher and friend, Dr. Luke Teskey. Naturally the three men in mind are Professors J. B. Willmott, Luke Teskey and W. T. Stuart. The Editor of *Oral Health* has fittingly said: "Older graduates of the R.C.D.S. remember with affection these three great men." I have long since passed into the class known as the "older graduates," and so I come to pay my tribute of respect and reverence to the memory of these three stalwarts of the earlier days.

It was in the autumn of 1880 that I entered the dear old R.C.D.S.—blessed be its memory—and these men were the bright particular stars in the firmament of my dental education. I looked up to them with reverence in those days, as one well might, but it was as nothing compared with the reverence in which I have held their memory in the perspective of the passing years. Long before the death of either of them I had learned to love them "beyond compare." They were something more to me than mere teachers—they were the exemplars of good living, and to be a good exemplar is better even than to be a good teacher.

I had the privilege of paying my tribute in the pages of this journal to the late Dean Willmott at the time of his death, and it was a rare privilege because of my high regard for the sterling qualities of the man, and my deep affection for him as one of my revered teachers.

When Professor Stuart died I for some reason did not learn of the sad event for a long time, and so I missed the opportunity of recording my appreciation of his many virtues. He was a man well worthy the emulation of every student. Clear in his statement of any subject he was teaching, incisive in his phraseology, and vivid in his descriptions, he was the ideal lecturer. I never knew a student, either in my day or later, who did not respect him. It is of such as he that the

bone and sinew of our race is most certainly preserved, and I am grateful for the privilege of sitting under him as a student.

As for Professor Teskey, the last of the three to leave us, I have some of the most pleasant memories of my student days. To me he was always gracious, kindly and considerate. While I held his time and talents in the highest regard, yet I felt that I could go to him in any emergency, or whenever a point in a lecture was not clear, and he would receive me with the utmost courtesy. I never appealed to him in vain.

One lecture of my college course stands out vividly in my memory as the most absorbing and impressive I have ever listened to. It was one by Dr. Teskey on Physiology, and the subject was "Function." As he warmed to his topic the man seemed to lose himself in contemplation of the marvelous processes which go on in the human body, till he wound up by holding before us a mirror of the miracle of our very existence. I shall never forget that lecture. I do not of course recall the words, I do not even remember the theories he advanced, but I remember the heroic figure of the man as he stood before us pouring out the eloquence that was in him, and holding that class of students as if in the "hollow of his hand." Walking out of the lecture room that day Professor Teskey was the magnet of every eye. He held the admiration—even the awe—of each one of the students at that moment. I turned to a fellow-student and said: "If I could ever develop the ability to deliver a lecture like that it would be the proudest achievement of my life." And I have gone on ever since vainly attempting to attain that distinction.

Another incident connected with my college days in which Dr. Teskey played a part comes to mind. We had to take our examination fillings to him for inspection, and I approached him one day with a contour foil restoration in a lateral incisor. I came with the proverbial fear and trembling. He was a large, heavy man, and on that day he looked to me as if he weighed a ton. And I could have sworn that he threw every ounce of that ton weight on that poor filling. How it ever stood up I am not yet able to figure out, but it did, and he said some encouraging word to me which sent me away happy. Only this thing occurred the next moment: A student followed me with a patient to show up some work, and it took just an instant for Dr. Teskey to roll that filling out into the patient's mouth. The boy colored painfully. It so happened that this student and I had clashed a day or so before over a chair in the operating room. I had my patient seated and he came in and claimed that he had reserved this particular chair for that morning, and raised so much disturbance that I finally requested the patient to vacate the chair and go to another where the light was not so favorable. The diplomatic situation between us was therefore somewhat strained, and when he saw that I

was a witness to his discomfiture at the hands of Dr. Teskey it was like wormwood and gall to him. He was not a favorite with the class and he knew it, and accordingly he dreaded the tender-hearted remarks the boys would make about his filling. As we left the room together he said in a dejected sort of way: "Johnson, I hope you won't say anything about this to the other boys." And I came nearer doing the decent thing that minute than I had ever done in all my life before. "Not in a thousand years," I said, and the incident was closed. That was nearly forty years ago and this is the first time I have ever mentioned it. Even now I would not reveal the identity of this student to any of the boys if I saw them.

But here I am, rambling along about my college days when what I started to write was a tribute to "Three Men." I submit that the profession of Canada owes more to these three men than to any other. They took the helm at a time when the way was not charted, when it was all virgin forest, and when they had to blaze the trail. They founded an institution which to-day is a credit to Canada, and which has attained distinction in a way that never would have been possible had it not been founded on the soundest and broadest basis.

All hail to the memory of these men! They wrought gloriously in their day, and they left a heritage that will pass on to future generations as a blessed benediction. I bring to them my humble tribute, my grateful acknowledgment for what they did for me, and my laurel wreath of love.

C. A. Johnson.

RE-FITTING OR ADAPTING AN ILL-FITTING VULCANITE DENTURE.—When the maxillary denture seems to be everything that it could be, but lacks perfect adaptation along the posterior border, thus allowing the ingress of air with the refusal of the case staying in place, this can be easily overcome by the following technique:—Dry the denture and trace some of Kerr's green stick compound along the posterior border. Place it in the mouth while the compound is soft, thus allowing the tissues to press it to place and seal this border. Make a cast of the posterior half of the denture, separate the two, then warm carefully the vulcanite over a small gas flame until it is pliable, place it on this cast and burnish it to place, holding it there until it is cool. If the technique was carefully looked after, the operation will be a success.—*Pacific Dental Gazette.*

ORAL HEALTH

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EDITORIAL

The Dental Profession and Dental Inspection

FOR several years the dental profession in the Province of Ontario has been urging the Provincial Government to take the necessary action to bring into being a system of school dental inspection. Time and again the Ontario Oral Hygiene Committee has waited upon the Minister of Education and emphasized the fact that the ravages of dental disease were playing sad havoc with the health and physical well-being of the citizens, and promising that should the Government take the initiative it would have the practical co-operation and support of the dental profession of Ontario. The present Minister of Education, the Honorable Dr. Cody, has acted upon the advice of our profession, and has made arrangements for the appointment of a Provincial Director of Dental Inspection for the Province of Ontario. The Department accepted the nominee of the Committee, and appointed Dr. Fred J. Conboy to undertake this important work.

The work to be carried on will be of an educational nature, the Department striving to convince the public and their representatives in Municipal Councils and Boards of Education of the urgent need of appointing a permanent Dental Inspector to work in each local district. The first essential to this propaganda is a complete dental survey of the schools of the whole Province, that the deplorable condition of school children's teeth may be made known to the people.

It is manifestly impossible for the Government to engage and send out a sufficient number of Dental Inspectors to accomplish this task

within a reasonable time. Nor would the dental profession expect the Government to do so. The profession has taken the initiative thus far. It has done so because it recognized the danger confronting the citizens, and was anxious to save them from pain and sickness. The members of the profession surely will not now hesitate to give a little time in order to bring this official provincial undertaking to a happy and successful termination.

There are two things which each individual dentist can do to assist this movement. In the first place he can write to the Provincial Director of Dental Inspection, informing him of conditions in his municipality, and advising him in regard to the best method of establishing a system of school inspection for that particular community; and he can offer to give, free of charge, a small portion of his time to assist in making the initial survey.

During the years of war dentists made noble sacrifices, many leaving large and remunerative practices to take their place in the Canadian army and care for the dental needs of our soldiers. The unselfish and public-spirited action of these men has brought great glory and honor to our beloved profession. Shall we not then be willing to give a few half days to assist in the establishment of a system which will conserve and protect the man power of our country which has been so sadly depleted by the war?

A Tooth Once Said :

NATURE considers me so important that she spends ten years in completing my development, while

MAN thoughtlessly destroys me in as many *months*, as it takes nature *years* to build me!

VITAL,—I can stand a pressure of one hundred pounds to the square inch, but
DEVITAL,—One half of my masticatory usefulness is immediately gone.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, JULY, 1919

No. 7

Trench Mouth

H. J. MERKELEY, D.D.S., WINNIPEG.

Secretary-Treasurer The Dental Society of Western Canada.

[Dr. F. Barron of Paris has requested "Oral Health" to discuss the treatment of "Trench mouth." Dr. Barron writes—"Very little has appeared in the magazines concerning this important subject. A writer in 'Cosmos,' suggested weak sulphuric acid, but I would prefer 'the other fellow' to try it first. A nursing sister from overseas was in the office a few days ago, and said they had been using in France a solution of ipecac, arsenic, and another drug. I may be asking a simple question, but I don't know the answer, and would consider as a favor some information of a 'rational' treatment for Trench Mouth."

"Oral Health" has received similar requests from other practitioners, and is glad to be able to publish Dr. Merkeley's article in this issue.—Editor.]

THE term Trench Mouth, primarily used to describe certain gingival conditions, has come to be very loosely applied until like its predecessor, Pyorrhea, it is now almost all inclusive.

Recent medical works lead us to believe it is of specific origin, while dental investigators are frankly not unanimous. The balance of opinion seems to lean toward lack of oral hygiene as a contributing factor, and poorly sterilized table utensils (overseas) as the means of the distribution of the infection.

The bacteriology of the infection is rather vague at present, but

we do have streptococci, and a very few staphylococci, while the anaerobes are represented by the bacillus fusiformis and its spirochaete, —said to be a spore form of the bacillus fusiformis. Certain other forms are present and are I believe chiefly responsible, though they may be ultra microscopic.

“Ulcerative Interstitial Gingivitis” describes the condition well. The clinical picture presents a slough closely approximating in general appearance that of an arsenic necrosis. It usually starts interstitially where the vitality of the tissue has been lowered by tartar, the impingement of the gingival ledge of a filling, a poorly fitted crown, or again the tissue flap covering a partially erupted 3rd molar may form a pocket and thus become the seat of trouble. In fact fifty per cent of cases treated to date point to this origin.

The infection spreads with great rapidity, and then assumes a stubborn chronic character. The floor of the mouth, tongue and cheeks are rarely involved, although there is a considerable rise in temperature of the cheeks in acute exacerbations. There is also a general rise in temperature of a couple of degrees, due no doubt to the absorption of ptomaines and toxins. Hard foods, also liquids (except of body temperature) are taken with difficulty. Pain may be severe enough to produce insomnia. A partial cure may bring a relapse in a few months, although it can hardly be called an intermittent infection.

The whole pharmacopea has seemingly been searched from end to end in an endeavor to locate a specific, but evidently to no avail. Due to mistaken ideas of etiology, arsenical poisoning has often been produced by certain washes used. Again, emetin has been tried and found wanting. Hartzell has advocated his favorite solution, creosote and iodine. Salvarsan has not measured up, and Methylene blue is useless. The above treatments are not rational. We must consider carefully the condition as presented. We have a slough carrying certain saprophytes and parasites producing their ptomaines and toxins. Rationally we would at least seek to get rid of the slough. Surgically this is a very difficult task, and opens up a rather extensive field for infection, so we must turn to our pharmacopia, where we find copper sulphate very active in removing slough, as well as in destroying with despatch most of the lower forms of bacterial life.

Our chief aim in the treatment being the removal of the cause and all contributing factors, we clean away the slough by applying dry crystals of copper sulphate on a small pledget of cotton, to each interproximal space where slough is present. Allow to remain three or four minutes then wash out with a water syringe. Repeat daily for three or four days, or if pain be intense, twice daily. At the first appointment prescribe Dakin's Solution (Johnson & Johnson) to be

used undiluted five or six times daily, holding the solution in the mouth for some minutes and using the cheeks to forcibly wash out the interproximal spaces. Now a word as to the Dakin Solution. Certain tablets are in use, but they are of uncertain strength, so it is best to use the solution made by the Johnson & Johnson method, which consists in breaking the ampules in a container. Your druggist should carry this equipment. When the pain is gone and the slough has been cast off (which should be in four to five days) a thorough examination should be made for all irritants. Remove these even to the removal of all shell crowns. If the third molars be badly involved, extract.

The irrigation of the interproximal spaces may, as in Pyorrhea pockets, be easily done with the sausser irrigator, being careful to irrigate, not inject. The destroyed gingival tissue will slowly regenerate and give a fairly good effect even in extensive necrosis. The brown stain produced by the wash is easily polished off. Treatment by irrigation and wash should be continued until granulation tissue has a good start, then iodine and violet ray massage may well be employed, keeping up the Dakin Solution as a mouth wash intermittently.

Dental Service for Schools for Mothers*

BY GEORGE THOMSON, L.D.S. ENG.

[The Pre-School Dental problem should not be overlooked in our establishment of School Dental services. Great work may be accomplished through mothers' clubs and other home and school organizations. The writer was afforded, in connection with his work as supervisor of the Dental service in Toronto schools, abundant proof of the importance of the pre-school age dental work.]

The author in this article outlines some of the work being undertaken for the little "kiddies" in England, and urges the importance of proper dental attention to the child "under six."—Editor.]

THIS paper is the outcome of some correspondence which has passed between this Society and some others on the need of supplying dentists to schools for mothers. Having been engaged in this work for some years, I was asked by our President to read a paper giving some account of my experiences as a basis for discussion and a full ventilation of the subject. It may be questioned whether this Society should widen its scope to embrace such a large problem as the question involves. Schools for mothers have recently spread so rapidly all over the Metropolis and the country generally that the

* A Paper read before the School Dentists' Society, September 7, 1916. From "The British Journal of Dental Science."

overtaxed dentist may think twice before he undertakes this arduous and pecuniarily unprofitable work. The devastating war of Europe which is decimating our population has awakened the minds of the people to the value of child-life and the mothers who bear them. It will never be known but to the few who have seen it what quiet heroic work has been done by the pioneers of this movement known as Schools for Mothers. Ignorant and thoughtless mothers with emaciated babies are brought from time to time to women who tenderly and wisely restore health and happiness to those who otherwise would have perished and been lost to the nation. A halo of glory rests on the women who are capable of doing this work, but it is an invisible one. Let your imagination picture the scene for a moment. Schools for mothers teach mothercraft. The National League for Physical Education and Improvement has published an invaluable brochure at threepence which tells concisely and clearly what mothers ought to know. About 10 per cent. of the children born die in the first year from preventable causes, and about $1\frac{1}{2}$ per cent. of expectant mothers lose their babies before they are born. These are appalling facts, and make their appeal to all who have it in their power to lessen this mortality. Civilized races have so many artificial objects to attain that they miss the simple and necessary while they get the luxuries and embellishments of life. Two things are necessary, nutrition and generation—the first to preserve the individual, the second to preserve the race. Otherwise expressed, environmental hygiene is not so important as personal hygiene. It is easier to obtain legislation for housing and sanitation than to secure legal protection for the life of the individual. For instance, Australia has proposed to legislate on behalf of those who go about with easily communicable disease, and proposes to fine £100 or imprison for twelve months the person who has a certain disease and communicates it to another.

It will probably be a long time before it dawns upon the country that the individual needs such protection. Model houses, sanitation, ventilation, etc., are important, but not nearly so useful as personal cleanliness. We are like the musician who develops the ornamentation of his subject so that the theme is obscured. Of personal hygiene, the chief part is nutrition. Very few people know what to eat, when to eat, and how to eat. The waste of good food in the kitchens of this country is a grievous fact. Dentists are necessary to the community because it is in their power to preserve the organs of the body which Nature has provided for the mastication of food, whereby the sense of taste and the excitement of appetite set in order the whole mechanism of digestion. Septic mouths and carious teeth, and the consequent bolting of food, and the necessary recourse to unnatural, overstimulating diets, bring about indigestion. Defective metabolism results, the whole body suffers, the powers of resistance to disease are broken down, and the joy of living is destroyed. Bonhote says:

"From the metabolic point of view, sexes are said to be fundamentally different, the male being katabolic and the female anabolic. The male is continually spending the greater part of his income, nutrition, as he receives it, whereas the female stores up a reserve which is expended periodically and used as a nutriment for the young." It follows from this that greater care and attention should be directed to the nutrition of the woman, and that the obstacles to which I have referred should be removed. Even more so is this the case for the expectant mother. For obvious reasons the life of the mother is more important than that of the child; it is more serious to lose a life in its prime. It is important that the mother should have sound teeth in order that the function of mastication should be exercised upon foods which will properly nourish the body and keep her in health, and that the anabolic condition may be maintained up to the birth of the child, so that she may be better able to sustain the shock of childbirth and have an abundant supply of milk to nourish her new-born babe. It is a popular idea that the nourishment of the mother is to be maintained for the purpose of nourishing the unborn; but, in fact, mothers who are ill-nourished—as most women, even of the richer class, are—bring forth normal healthy babies, Nature having provided that the unborn gets its nourishment at the expense of the mother's tissues. On this subject, Dr. Arch. Donald, of Manchester, says: "The term 'antenatal' is comparatively new, or has only been used freely within the last few years. It is an objectionable word compounded of an adverb and an adjective, and is often used by those who are fond of it in an ambiguous way. 'Antenatal treatment' means, I suppose, treatment of the unborn child, but antenatal treatment of the expectant mother means literally the care of the expectant mother before she is born. What is really meant is the care of the pregnant woman, but that is too vulgar an expression for use by officers of health. The unborn child can only be influenced through the mother. Anything which improves the mother's health will probably give the child a better chance, although it does not always happen that conditions which cause deterioration affect the child to any great extent. The fœtus is, generally, the last to suffer."

Nurses and doctors often believe themselves to be much wiser than Nature, and come between the mother and child and prevent by their skill Nature's food being given to the child, so that both mother and child continue to require medical skill. Lactation is a psychic act, and may be checked by suggestion. At this stage also the mother needs good teeth to keep her physical processes at their maximum. It is not by drinking stout, or milk, or taking tonics, that she will maintain a healthy digestion and regular action of the bowels, but by mastication of the food of the kind which requires chewing and excites an abundant flow of saliva. I want to establish the truth that good teeth are necessary to the mother, for there are still quite a few, who

ought to know better, who do not believe it or teach it. Dental caries and septic mouths are known to be prejudicial to recovery after surgical operations, and therefore must have injurious effects upon parturition. During pregnancy is not the best time to perform extensive dental operations, but surely it is better during the early months of pregnancy to restore the mouth to a condition of health than to allow an accumulation of the danger to exist. It was suggested to me soon after I began this work that some of my patients had miscarried owing to the extraction of teeth under an anæsthetic, but on investigation this was found to be untrue.

During pregnancy women are more difficult to deal with, as they are full of fears and superstitions and highly nervous, and more so after days and weeks of sleeplessness due to persistent toothache and inability to masticate. Such suffering is often tolerated partly from fear of the dentist or from recollection of the untrained hand of a pretender to the art of the dental surgeon.

It is a hopeful sign that public interest has been awakened in this subject, and out of many letters and articles which have appeared from time to time I quote one paragraph from a letter of Dr. Barbara Tchaykovsky in the *New Statesman*, August 1, in which she says: "But much help is needed. To mention only one item: dental treatment for expectant and nursing mothers, whose teeth were neglected in childhood and whose breast milk is thereby poisoned and impoverished. Yet the doctors tell us that the breast-fed baby has *ten* times the chance of the artificially-fed one to reach its first birthday. Perhaps some 'Good Samaritan' will give us a dental chair?" One's obvious reply to this is, *not* a dental chair, but a dentist. My experience of the work is that it is discouraging if one is looking for immediate results, yet the work is one of national importance. The women are usually enticed to have their teeth examined with a promise that nothing will be done; they usually return, however, and submit to operations.

It is somewhat bizarre to turn aside from a busy practice, where one's services are being sought after and remunerated, to urge and persuade ignorant and thoughtless women into a course for their own good. The women themselves are not appreciative of what is done at the time; they do not realize the cause of their improved health and the absence of dental pain. However, in work of this kind one is looking further than the health of the mother on to the future of the child. It has taken a great war to stir the lethargic minds of English people to realize the vital importance of child life and the necessity of conserving the coming race from the day of arrival into this good and evil world.

The Jewish nation has always been peculiar in its care for the child, and I find among Jews to-day well-developed jaws and teeth

with good enamel, such as is not usual among our ordinary patients. Here is proof not only of a healthy and pure inheritance, but a healthy environment, *e.g.*, breast-feeding. The one factor in producing a healthy child is breast-feeding by an intelligent loving mother.

I only speak from the impression I have gathered from personal experience and observation, but I believe V-shaped arches, post-normal occlusions, and other irregularities of the teeth are commoner in this country than in any other, and if we ever have another International Congress I hope we may be able to get light upon this subject. I believe also these deformities are due to environmental causes and are not ante-natal. But the work of schools for mothers includes the child, and besides the children of the Nursery Schools who are brought to me an increasing number of the mothers bring their young children. I have filled teeth at 15 months, and it is quite a good thing to get a child seated in the dental chair and sent away with a pleasant memory of it before anything requires to be done. With a brush in the dental engine the fear of the drill may be overcome. The child should always be made to look at the dentist—catch its eye, and give it time to take you in. Children are quite easy to manage if one has patience and can wear a cheerful countenance which is not false. Children know. Of course, it is quite foolish and sentimental to be fond of children, but quite the thing to know how to manage dogs and horses. The Royal Society for Prevention of Cruelty to Animals knew their chance at a child-life exhibition where they were well installed against a smaller stall of the Royal Society for Prevention of Cruelty to Children. The public subscribe more liberally to the former than the latter. If prevention of dental disease is to be successful, I am of opinion that children must be periodically examined from the age of 15 months. Some can be dismissed for a year, but others will require attention then or soon. Six months of pap feeding, fattening up on starch and sugar by the doctor's orders, is sufficient to produce caries in the first temporary molars before two years of age. "In beginning to feed cereals—they should be salted, but no sugar should be used. If babies begin to eat cereals without sugar, they learn to like them in that way, and as they grow older, do not expect to have them or other foods smothered in sugar."* It is too late when toothache begins. Mr. F. Newland Pedley says: "Another way would be carefully to inspect and treat the teeth of every child from the time the first tooth is cut, making dental neglect a punishable offence." If we can demonstrate to the mother that her child is destroying its teeth by the diet she is providing, we have started on the road to prevention. If prevention is attained, as it may be quite simply by the methods advocated by Dr. Sim Wallace, then the school

* Morse and Talbot.

dentist of to-day will find his patients already immune. "Utopian," you say. "No, sirs, it has already been done, and often; and we want it to be universally adopted, that the nation may have good teeth and digestion and all that means."

Mr. J. H. Gibbs, F.R.C.S. Edin., says: "The establishment of school dental clinics, although in my opinion a sheer waste of time and money, indicates the advent of a stage that we must pass through before we can expect simple preventive measures to prevail." He goes on to say that the prevention of dental disease should be part of the work of the medical officer of health. In my experience this work requires all the skill and ingenuity that a dentist can bring to bear upon the case. The filling of carious temporary teeth without pain or exposing the large-sized pulp, the extraction of temporary teeth with broken-down crowns and their thin, slender branching roots, are but examples of the difficulties.

To my mind it is criminal to neglect the teeth of a child till six years of age and then extract all its temporary molars. Think of the months of toothache the poor child has suffered, the sleepless nights till the pulp dies, then sets up an abscess and, lastly, a sinus opens and discharges. Are we going to say, "It can't be helped," and do nothing? Let us make a start on the babies born during this war and see if it is not possible to rear them with an immunity to dental caries. It should be remembered in this connection that all school medical inspection and treatment as practised now all over the civilized world had its origin in dental school clinics. Dr. Jessen, of Strassburg, at the Hague Congress of 1913, advocated dental treatment of the child at 2½ years, and it was his intention to develop this idea at the International Congress of London in 1914. My own experience had convinced me some years back that a great opportunity for prevention of dental disease is lost, never to be regained, if the child passes the age of three years before it visits the dentist. Dr. Ralph Vincent said some years ago that "infantile malnutrition is the most serious of all the conditions prejudicially affecting the country at the present time, and this refers entirely to infants born healthy." "Bad air, overcrowding, insanitation, etc., cannot cause rickets if the child is properly fed"; and this also applies to dental caries. The food of the child at two or three years of age consists of bread soaked in milk or such like, finely minced meat and very little of it, and patent food, so that it is starved of protein and fat and has an excess of carbohydrate food.

I began this work five years ago, on the suggestion of Dr. Murray Leslie, at the St. Pancras School for Mothers, the first and pioneer of those started in this country, which has been maintained in its efficiency under the presidency of Lady Meyer. I first gave some lectures to the women, and I invited them to come to the British

Dentists' Hospital, which had just been opened near by and, though well equipped, had very few patients. It was found desirable, however, to see the patients on the premises for reasons I have already stated; and I think it may be accepted as final that these women must be attended at a school for mothers and not at a general hospital. Miss Nancy Williams and Miss Bennet understand these women so well that any success I have attained is largely due to their indefatigability. My record is largely that of failure. I started out with two Nursery Schools close by, where the children are under six years of age. I first made an examination at the schools and noted all those requiring treatment. The children were not brought to me with any kind of regularity, and the charts I began with became useless; this does not alter the fact that I have seen many of the children who have been treated after one, two and three years who have practically passed through those years without toothache, or further caries, because incipient caries had been treated and cavities filled or septic molars removed.

From September, 1915, to September, 1916, there were 57 attendances of the children from Cartwright Gardens, for whom I did 39 fillings of various kinds, extractions with gas twice, 13 extractions without, and one regulation case with prenatal occlusion. Somers Town School made 35 attendances, and I did 30 fillings, 4 extractions with gas, and 15 without. Only 2 to 6 children were brought at a time; I could just as easily have seen 10 to 15. I have come to the conclusion that the only way to secure dental treatment for these children is to have a portable chair and do the work at the school. At 3 years of age 75 per cent. of these children have good teeth. This does not apply, however, to the promiscuous children who are brought by the mothers. In the same year I have recorded 92 attendances of these, aged from 1 year 5 months to 7 or 8 years. For these I put in 71 fillings; 21 had gas for extractions, and 21 without; also one regulation case was treated with an upper expansion plate. As for the mothers, from September, 1914, to September, 1915, there were 164 attendances, viz.: 23 gas cases, for whom 3 to 10 teeth were removed at a time; 8 without an anæsthetic; 38 fillings; 15 scaling; 11 dentures. 1915 to 1916: 185 attendances; 16 gas cases; 5 without anæsthetics; 24 fillings; 8 scaling; 10 dentures.

I am not in a position to prove it, but my opinion is that if the younger mothers could have dental attention early, it would be found that on an average four to six teeth need to be removed, about four filled, and healthy mouths would be the result. Dentures would only be required for the older ones, and many of these would have cleaner mouths without them. The chief reason for the small attendances, apart from the reasons I have stated, is the difficulty of their paying even the small amount of 1s. per week, which they have been asked to contribute to the expense. I believe, therefore, the successful treat-

ment of the mothers can only be reached by the Societies which deal with these women making the dental services free. If dentists will give their services voluntarily, the equipment of a clinic and the provision of materials would not be a heavy expense. The schools for mothers might on their own account collect small sums from the mothers to help their expenses, and a special fund could be arranged to provide for the few dentures needed. Large sums are now being spent on school dentistry; some of this money would be better spent on the little children and their mothers.

Example is better than precept—I have given you the results of my experience; I leave it in the hands of those with better organizing capabilities to show how much better this work might be done.

In conclusion, I would plead earnestly for the care of the young child. I believe no greater reform can be of more lasting benefit to the community than the saving of the temporary dentition in a sound condition. Many children who contract diseases, and die before the age of 5, would be saved if they had sound temporary molars and were able to masticate the food that their instinct teaches them to be good.* Our President many years ago called attention to the shocking condition of the teeth of young children, and their condition of malnutrition; and Dr. Sim Wallace has proved that the kind of feeding children mostly get is responsible not only for their defective teeth, but for the breakdown of their physical resistance to disease. It is in the power of the dentist to prevent it, and the State should make it compulsory for parents to see to it that toothache and dental caries are prevented. The Right Hon. Henry Hobhouse said: "The question of systematic dental treatment is a formidable one, owing to the widespread nature of the evil and the issues involved in dealing with it, especially among scattered populations, *yet it will have to be faced* if we are to secure a strong and healthy race in the future. A good deal can be done in the way of prevention by the public authorities at very little cost." I wish further to say that I believe it is practically possible to prevent the dental caries of the child under the school age, and that if the temporary teeth were saved, the permanent ones would take care of themselves, for the habit of mastication would be continued. The work of the school dentist continues to repair the damage wrought by neglect in early childhood, and must continue so long as it is a necessity. If the State chooses "to shut the stable door after the horse is stolen," it must pay the long price. I have said it is possible, but I believe it is only possible if the State is willing to compel this early attention.

The health of future generations is bound up in this problem, with the prevention of tuberculosis, the treatment of rickets and all the exanthemata of childhood. "If I have said aught ill, let it be suppressed with gentleness; and if aught good, let it be received with joy."

*Pitt, page 104.

Keeping Workers Well

DR. RALPH W. ELLIOTT, GENERAL ELECTRIC COMPANY.

[During these important days of reconstruction a vital factor in our social and industrial life is that concerning the health and contentment of the worker. And who is not a "worker" in these wonderful though tragic days? Certainly practising dentists must be included, because they not only work (and work hard), but they render exceptionally important service in adding to the health, comfort, and appearance of the citizens.

The establishment of a health service in many large industrial organizations is but a forecast of future developments in this more recent branch of industrial life.

Dr. Elliott, in the accompanying article, deals particularly with the dental phases of the question, and has given an interesting purview of the work and usefulness of the Dental officer engaged in industrial service.—*Editor.*]

NO industrial plant is complete nowadays without a dentist. It pays to keep the workers well. The industrial physician has his place in every large factory, and it is beginning to be recognized that his work is incomplete and unsatisfactory without a dental clinic. Such is the statement of Dr. Ralph W. Elliott, of the General Electric Company, writing in *Factory* on the subject of "Keeping Workers well." The work of the dental dispensary, says Dr. Elliott, covers several distinct branches of dentistry—namely, the relief of pain, examination and consultation, prophylaxis, consultation with the medical department, and the filling, treating, and extraction of teeth. The examination of applicants for employment now frequently includes dental tests. Co-operation with the general medical work of the plant is also an interesting feature. To quote Dr. Elliott:

"One of the most important functions of the industrial dentist is the work he is able to do in co-operation with the plant surgeon. These men, so far as possible, are at the factory office during the same hours of the day, so that they may be available for consultation at any time.

"One great advantage that we have found in this arrangement is that all of the work in physical examination is done at one sitting. Not only is this a great saving of time, but the applicant is much impressed by the thoroughness of the examination.

"In order to have the doctor and the dentist co-operate to the fullest extent, their rooms, if possible, should be adjacent. Their records should be kept in the same file. So much importance is attached to the value of dental work in industry that medical and dental super-

vision are always installed at the same time in each of our new factories.

"Many instances might be given of the value of co-operation between the dentist and the doctor, but one of the most striking that has come under my observation occurred in one of our divisions last fall. For six months an employee had been practically confined to bed or was on crutches for weeks at a time as a result of sciatica. One day he attended one of our talks to factory employees on hygiene; later he reported for physical examination. This examination was voluntary on his part, as he was an old employee, but his interest had been awakened by the talk on hygiene.

"The plant surgeon could find no evidence of any infection that might have been the cause of his sciatica. He had been advised to have his tonsils removed, yet they were normal. No infection was found in the kidneys or other vital organs. On inquiry, he stated that his teeth had been examined as late as two weeks previously. The condition of the teeth, however, led us to suspect that the trouble might be there. This suspicion was confirmed by the factory dentist, and he was advised to have radiographs taken of all his teeth. The result of the x-ray examination showed seventeen abscesses at the roots of as many teeth. All of the infected teeth were removed, with the result that his sciatica has disappeared and he has thrown his crutches away

"To take care of all the dental needs of the employees in any one of our factories would require several dentists, giving all their time to this work, while under the present plan the greatest amount of good is rendered to the largest number of persons by one dentist. We do filling and other like dental work only in exceptional cases or when absolutely necessary.

"In the routine examination and prophylactic treatment of cases it was thought that the entire working force of the average factory, from four hundred to six hundred people, could be handled at least twice a year. At one of our divisions every case received treatment in a routine manner and it took about eleven months. In another factory they have been unable to complete the round in a year. However, the work is moving much faster as the technique and scheme of working is better understood by both the dentist and the factory executives.

"One factory reports that this year the round can be completed in from four to five months, which is about the period that should elapse between prophylactic treatment and observation of each case. This time also includes the large amount of time consumed in emergency work and in the routing treatment of cases requiring other than prophylactic care.

"The good will established in the relationship between the factory dentist and the employee is beyond doubt. We hear many words of

appreciation. Some have offered to pay for the service, but we believe that in our own organization this work should either be done for nothing or not at all.

"The equipment of our dispensaries is the best that we are able to obtain. This enables the dentist to do better work, but better than this is the fact that the employee is impressed by the painstaking character of the work. From an educational standpoint, therefore, we feel that it has paid us to maintain this excellent equipment. It has benefited the employee by impressing upon him the difference between good and mediocre dentistry.

"We have recently added to our equipment an especially designed x-ray machine for dental work. This last addition was made as a result of census of cases reporting in our clinics who were in need of x-ray work.

"In one dispensary we found that 85 per cent. of the patients would have been benefited by x-ray examination, and yet but a small per centage of these individuals actually had radiographs taken. No doubt this was due in part to the expense, but aside from this the distance from the factory to the x-ray laboratory was so great that it would have been quite a hardship to ask the employee to take the time from his work which would be necessary for him to make the trip.

"Most of our resident dentists are picked men, chosen not only for their professional ability, but because they have a keen interest in industrial work, and are prepared in most instances to make the practice of this branch of dentistry their permanent work."

The Contact Point—Its Relation to the General Health*

BY WALTER R. HUGHES, D.D.S., OAKLAND, CAL.

WEBSTER'S International Dictionary defines a contact as being the property of two curves, or surfaces, which meet, and at the point of meeting have a common direction. It is taken from *contigere* and *contactum*, to touch, a close union or junction, a touching or meeting.

The Standard Dictionary gives contact as the coming together of two bodies in space; or touching or meeting. The tangency of two surfaces or lines or one object with another.

The Century Dictionary uses contact as opposition of separate bodies or points without sensible intervening space. The act of making one body abut against another.

*Read before the Alameda County Dental Society, December, 1918.

Thomas' Medical Dictionary defines contact as derived from con, together, and tango, tactum, to touch. The state of two bodies that touch each other.

Dr. Black defines the contact point as being a point on the proximal surface of a tooth which touches a neighboring tooth. In the first volume of his work, page 86, he further states: "In studying the buccal view, it will be seen that points of near approach of surfaces are very narrow and rounded in form from occlusal to gingival so that the actual touch point of unworn teeth is very small, like that of two marbles coming in contact, while in the view of the occlusal surfaces, the points of near approach to each other are shown to be much broader in bucco-lingual direction."

Bromell in defining the "interproximate spaces" says: "In the mesio-distal direction the crowns of the teeth are broader at their occlusal surfaces or cutting edges than at their necks." This bell-shaped form of the tooth crowns causes their proximate surfaces to touch at a point which is usually near the cutting edge. He also states, "That the teeth of some types have a slight point of contact while those of other types cover a greater extent of tooth surface."

In Johnson's Operative Dentistry reference is made similar to this, "near the occlusal margin the surface is full and rounded, giving a point of contact for the proximal side."

All writers upon this subject agree that the contact points of the normal denture are similar to tiny little knives which assist in excising the food and directing it through the embrasures. A true contact point, then, has theoretically position but not magnitude. Not only do the contact points assist in triturating the food, but also each normal contact tends to take up the strain, stress or shock incident to masticating the food and transmit a part of the force to the adjoining teeth, so that each tooth will not battle alone.

The shape and color of the teeth blend with the complexion so that the mouth should have a harmonious relation with the other features. The contouring or rounding out of the teeth to form contact points upon the mesial and distal surfaces lends much to the characteristic beauty of the individual. It is this deviation on contours that renders the architectural appearance of the teeth different from a civil war cemetery with stones set all in a row.

The functions of the contact point are: First, to act as knives in exercising the food during mastication; secondly, to act as shock absorbers or buffers taking up and transmitting the shocks; thirdly, to prevent injury to the soft tissues; fourthly, to add to the appearance of the possessor.

Now let us ascertain some of the forces that act to destroy the points of contact, and study methods for their correction.

1. Malocclusion.

2. Loss of contact by extraction.
3. Interproximal wear.
4. Faulty dental operations.
5. Plus contact in one jaw.

1. Malocclusion. Angle says: "Malocclusion of the teeth is the perversion of the normal relations of the occlusal inclined planes of the teeth when the jaws are closed." The pleasing symmetrical and beautiful lines of an artistic intelligent face may be drawn into a deformity of ugliness, if the teeth are in malocclusion. Often the perpendicular development is greater in one portion of the arch and causes an unequal strain or stress in that particular region. It is a common experience to find one or more teeth misplaced in either buccal, labial or lingual occlusion. However, any form of malocclusion will cause a loss of contact. Angle has laid down a rule which is applicable to general dentistry as well as orthodontia: "The best harmony and best proportion of the mouth in its relation to the other features requires that there shall be the full complement of teeth, and that each tooth shall be made to occupy its normal position." Thus, if the operator in general practice should notice the teeth to be erupting out of their proper alignment, then it should be his duty to either correct the malocclusion himself, or send the patient to a specialist of orthodontia.

2. Loss of contact by extraction. What a noticeable inharmonious expression exists when a patient has lost a tooth or teeth. But the patient has suffered more than the immediate loss of the dental organ. If the operator does not insert an artificial substitute to retain the teeth in their proper relations, in a short time there will be a loss of contact of the teeth in that locality as well as those in the opposing jaw. The tooth without an opponent is extruded from its alveolus or deflected from its normal position, and as a result the contact either mesially or distally is lost. Whenever there is a loss of contact between two teeth the food crowds into the interproximal space and causes soreness and pain in that locality. This pain experienced by the patient while eating, rather increases the tendency to bolt the food, partly masticated. On the other hand, the lack of trituration of the food will tend to result in stomach trouble and allied complaints, thus jeopardizing the patient's health. It is plainly to be seen, then, that the loss of contact between two teeth not only is a great discomfort to the patient but causes inflammations to stomach or intestinal tract and allied maladies may ensue together with the deeper inflammation of the area around the affected teeth which later may develop into a very stubborn case of pyorrhea alveolaris. The operator can best appreciate the value of the contact points if he has the efficiency of a few teeth impaired by the loss of contact points.

3. Interproximal wear. It is estimated that the length of the arch

is shortened about one centimeter for a patient about forty years of age, by wear upon the interproximal surfaces. The interproximal wear increases as the patient advances in age. There is a continual pressure exerted upon the teeth to maintain them in their relative positions. Each tooth has a slight individual motion in its socket. This tooth movement occurs each time the patient closes his teeth. The interproximal wear is the result of slight, but continual tooth motion. These wears occur upon the teeth performing the greatest amount of work, frequently being exaggerated upon molars and bicuspid where the biting stress is the heaviest. If these wears continue unchecked for an indefinite time, the result will be an injury to the gingivae. The continual lodgment of food between the teeth will either cause a beginning of decay in the gingival area or set up an interproximal irritation in the soft tissues which finally results in pyorrhea alveolaris. The contiguity of the approximal surfaces of the teeth greatly favors the retention of food and the harboring of micro-organisms. How much greater the liability both to decay and pyorrhea when the food is allowed to crowd past the contact point.

The treatment for such cases suggests itself. The need for eradication of this fault in the dental apparatus is more emphatically impressed upon the operator if he has been a like sufferer. But in passing a subject of such importance the writer wishes to emphasize the necessity of wearing a separation of gutta-percha for from one to ten weeks or until a filling can be made with a normal contour. This may be either a gold foil filling, an amalgam filling or an inlay, as the case in hand may demand.

4. Faulty operations. Too often the mesio-distal measurement of the arch is shortened by faulty dental operations. Fillings are made with no detour. Sometimes fillings are seen that do not approximate each other with any semblance of a contact point. Yes, sometimes approximal fillings resemble a letter S in appearance. Such operations should be removed and base-plate gutta-percha placed in the cavity until the required interproximal space has been secured. This space must be wide enough to insure a normal contour to the finished operation and a free circulation of blood in the gingivae at this point. The best result will accrue to the operation if the gutta-percha is changed every three or four days until the distance between the teeth will permit a finished operation to be made.

If much looseness has occurred to the tooth a gold inlay makes the best material to use, or a good silver amalgam would make an ideal second choice. The Crandall method of amalgam contours insures a perfect result when used with caution. Whether this or some method equally good is used care must be observed to finish the amalgam into nicely rounded contours and insure a perfect contact point.

5. Plus contact points. The plus contact point is frequently noticed with the lower six anterior teeth. The lower jaw seems relatively too large for the upper jaw. When the patient closes the jaws the lower teeth occlude too hard against the upper front teeth. This causes the upper front teeth to lose their contacts and finally result in their separating in that ugly fan-shaped appearance. It seems almost impossible to restore the beauty to the mouth when this has taken place. When the individual tooth-pattern of the lower teeth is a little too wide for the segmental outline of the upper denture or the interproximal wear has been greater upon the upper teeth or probably no wear has taken place upon the lower teeth a pressure is exerted too great for the labial plates of bone of the upper and lingual plate of the lower. This causes a bone absorption and finally results in pyorrhea in both localities.

A treatment for this case might save the front teeth of both jaws if taken in time. With a "lightening strip or disk" reduce the width of the lower teeth. The treatment if stopped now would be only partly successful. With a good stone also reduce the length of the lower teeth until the articulation is as near normal as can be made. After the occlusion and contacts have been reduced to as near a normal condition as possible, polish the teeth.

If one hopes to successfully treat pyorrhea one must observe these three cardinal principles or the pyorrhea treatment will not be successful. The three conditions of a perfect treatment are:

1. Thorough root surgery must be performed.
2. Proper occlusion must be maintained.
3. Correct points must be retained.

If you fail in one, you have failed in all. The manifestations of foci of infection upon roots of teeth will not be completely obliterated.

It is asked, "why bother with so small a thing as a point of contact?" In this bundle of sticks are thirty-two pieces of wood. If each is taken separately only slight force is required to break it yet when the thirty-two are "en masse" it would require many times more force to break the bundle than when each is taken separately. So with the teeth. Each tooth braces its fellow. The teeth are held apart by the contact points. While the contact points approximate each other with some degree of force, yet there is sufficient room at the gingival to allow a free circulation through the soft tissues and to give a protection to the pericemental fibres. On the other hand, should the contact points become flattened or destroyed by approximal wear or by caries the approximating teeth would touch each other with flat sides or surfaces which would tend to cut or injure the delicate fibres and cut off the circulation at that point. Not only, then, is the normal contact of the teeth on their approximal surfaces essential for lateral support, but the correct contacts are found equally neces-

sary for the protection of the gingival tissues during mastication. Therefore, a restoration of a normal contour affords protection to the delicate gingival tissue by preventing the lodgment of food in the interproximal spaces. This bridging over of the interproximal space by the contact points renders a protection to the gingival and assures a normal circulation, protects the pericemental fibres and as a result assures health to the part.

In studying the anatomical formation of the teeth it is observed that nature has placed the contact points on the approximal surfaces of the teeth to outline a natural form to the particular tooth. It is architecturally formed to perform the functions assigned to it. The incisors and cuspids are given forms to excise or cut the food while the bicuspid and molars are produced in forms best suited to grind the food. It is also observed that the contact points are placed upon the tooth surface in such a manner as to lend comforts to the possessor and add a useful life to the teeth. Another function of a perfect point of contact is to lessen the liability of decay upon tooth surfaces or to render them immune to decay. When making operations upon the approximal surfaces of the teeth the operator should, as far as possible, make a replica of the normal contour and of the points of contact, thus rendering a very useful service to his patient. The original contour should be added to the flattened or worn surface, and the carious tooth restored to a requisite contour if the patient is to have everyday comfort and as far as possible be rendered immune to disease of the gingival tissues.

I have this thought to leave with you regarding the dental services it might be your opportunity to render the boys going into the army. These fellows cannot be cheated in health because the dentists are in a hurry and have not time to perform the right kind of service for them. They are risking their all for us and in return we should give them the very best in our power, so to do less than that would be a base ingratitude for the service they are rendering their country and the individual protection afforded you. Perfect contact points will go a long way toward keeping them in comfort and health upon the battlefield. The same thought is applicable to our patients.

Health is the greatest asset that the human body can possess. It should not be jeopardized by faulty dental operations. In balancing accounts or taking stock of our conditions it is observed that health is the most valuable of all things possessed. It is said that 60 per cent of the ordinary diseases of the human family are caused by lack of attention to the mouth. A duty which every dentist owes his patient is to advise the services which when rendered, will maintain him in as high a standard of health as possible. On the other hand, should the patient be in ill-health or not quite up to the normal standard of health, see if a faulty or leaky contact may be held accountable for

his condition. Correct contact points are just as conducive to good health as the food that is eaten or any precautions the patient might take to defeat sickness. Correct contact points are the links in the chain that lead to good health, but if one of the links is broken, it not only leads to a loss of teeth, but is a causative factor in the production of oral sepsis. Look well to your contacts.

Dr. Charles H. Mayo said: "It is evident that the next great step in medical progress in the line of preventive medicine should be made by the dentists. The question is, will they do it?" Now that the dental profession has a full knowledge of the physiological functioning of the mouth as an important organ of the bodily economy, we readily observe that the duty of the dental profession is not simply one of "mechanical repairs." But its duty to the healing art is to make those "mechanical repairs" as near a replica of nature as human skill will permit.

There is no pathological difference existing between a case of tonsilitis and a suppurating condition of the gingivae. This septic condition of the gingivae may be induced by a loss of contact points. The great surgeon of the day recognizes sepsis as the most potent factor in infectious disease found. The dentist will go a long way in aiding the physician to check the cause of a large number of diseases by making operations upon tooth surfaces which will not maintain a hidden cause of oral sepsis. The missing link in the chain of evidence which has deterred the physician from making the correct diagnosis may be septic dentistry. Is it any wonder then that the physician, knowing himself defeated in his diagnosis and treatment of many diseases, on account of oral sepsis, desires the dental surgeon to meet him on terms of equal responsibility. The dental profession must realize the fact that the continuance of the patient in good health depends upon the underlying principles of oral antisepsis. Whether it be follicular tonsilitis or suppurating gingivitis the pathological condition is the same, namely, sepsis. The responsibility of the dental profession to the general health of the patient rests in making operations in the mouth which will not be a source of septic infection in the mouth or a source of sepsis to the body. Therefore, make your approximal operations with contact points sufficiently strong to insure the health to the surrounding tissues.—*Pacific Dental Gazette*.

Universal Training for Health

DR. Edwin F. Bowers states that if every young man gave two or three years of military or naval service to his country, and if the Government responded with adequate medical and dental attention to its young manhood, the average of health and longevity would increase with a gigantic bound. The author claims that

under such circumstances western nations should become as healthy as any on earth, and then only would be really prepared to fight off our most constant and deadly enemies,—preventable organic disease and remediable functional weaknesses.

The plea for universal training was made in an article in *Everybody's*. Dr. Bowers proceeds: Of far greater importance than the educational and inspirational values of universal military training is the fact that the military examinations preliminary to enlistment would disclose a great number of latent or developing conditions, such as tuberculosis, nephritis, diabetes, high blood-pressure, functional disorders of the heart, correctable surgical conditions—as hernia or varicocele—nasal obstructions, adenoids, and dental caries or tooth decay, and various other common disorders, which, taken in their incipency and properly treated in military and naval hospitals, could be cured.

The conservation of life and health, the mitigation of suffering, the regeneration of those who might go on to helpless crippledom, the transformation of decrepit, imperfect physical machines into efficient and perfect human dynamos, capable of doing their full share of the world's work, which would follow this gratuitous medical and surgical service, would be incalculable.

It would save not only the manhood of America, but the womanhood and childhood as well, through the better and broader knowledge of hygiene, sanitation, and diet, which all our young men would absorb, carry back home, and spread.

We have for many years been harping on that somewhat frayed and unresponsive chord, "See your doctor." In this admonition we have in mind almost exclusively the middle-aged man—the father of a family, who is beginning to show signs of organic weakness.

Usually the best we can do for him is to put him on a diet, and forbid his doing everything he wants to do. Rarely do we cure him. At best we keep him from getting much worse. He is interesting, however, for he is the bread-winner, and he can't well be spared.

But how about the youth of sixteen to twenty-two who will, within a few years, become the bread-winner in his turn, and who is now diligently rehearsing for the part of an apoplectic or a dyspeptic?

Under the Government medical service necessary in universal training, all our efforts and skill would be bent toward keeping him from *needing* medical attention. In the vast majority of instances, the treatment inaugurated in youth, and the regime mapped out for one who had a tendency toward a "liver," or high blood-pressure, or kidney disorder, might entirely prevent, or else postpone, the appearance of these symptoms.

Under our present plan a very small percentage of our young men

of military age apply for enlistment in the army or navy. Yet at the time they make their applications the majority of them are cocksure that they are physically all right.

It is something of a shock when between fifty and seventy-five per cent of them are told that they are unfit for military service. This redounds most ingloriously to our shameful short-sightedness and ignorance. For probably seventy-five per cent of the conditions for which these lads were rejected are readily curable.

Instead of enlisting these boys and turning them over to the dentists, surgeons, and doctors to be made whole again, we send them away. As the boys lack advisers or money for medical care, they drift back into the ranks of the do-the-best-we-canners, and go from bad to worse.

We have by this rejection stultified a praiseworthy initiative, unconsciously put a slur upon a patriotic motive, and deprived a curable medical or surgical case of an opportunity to be made whole and well.

How do we know that a large percentage of these rejected applicants could be cured?

Adjutant-General H. P. McCain, Surgeon-General Rupert Blue, Surgeon-General W. C. Gorgas, and Surgeon-General W. C. Braisted, of the Navy, have courteously sent me reports and tables of statistics which deal with this matter in detail.

I quote from a portion of Dr. Braisted's report:

NAVY AND MARINE CORPS.

Total number of applicants	106,392
Total number rejected for all causes	74,280
Causes of rejection:	
Deformities	4,292
Ear—	
Defective hearing	958
Other diseases of ear	391
Eye—	
Color blindness	2,361
Defective refraction	9,260
Other diseases of eye	753
Flat feet	8,188
Hemorrhoids	1,105
Heart affections	3,149
Hernia, or tendency to	1,647
Mental diseases	273
Nasal abnormalities	597
Skin diseases	1,196
Teeth, defective	7,751
Tuberculosis, or suspects	730

Varicocele and varicose veins	4,598
Venereal diseases	1,455
Other miscellaneous causes	25,621

Let us study Dr. Braisted's statistics, remembering that the more an applicant stands in need of medical aid and the benefits of a wholesome, regular life and good, nutritious food, the more quickly his application should be accepted, and the sooner he should be turned over to those who will round him into as near a perfect man as his physical limitations permit.

We can not argue with the item "Deformities," although the question naturally suggests itself, "What deformities?" We can not forget that Lord Byron, the club-footed, swam the Hellespont, and that some of the greatest military geniuses in history had some physical defect. We can not suppose that many actual cripples apply for admission into the army or navy.

Next, "Defective hearing." From what cause? Many cases of catarrhal deafness are, by skilful treatment, entirely relieved, and many hundreds are cured by simple measures.

"Defective refraction" is corrected by wearing a properly graduated pair of lenses. Some of the greatest generals in the European as well as in our own armies wear glasses.

"Flat feet" can be relieved by wearing properly adjusted shoes, or by some simple orthopedic appliance, together with a course of foot gymnastics calculated to strengthen the muscles and ligaments forming the arches.

"Hemorrhoids" are cured by the thousands every day in private and hospital practise.

If the "Heart affections" are not organic, they respond quite uniformly to skilled treatment, which restores compensation and relieves irregularities. Some such simple device as abstaining from cigars or tobacco may be all that many of these cases require.

"Hernia, varicocele and varicose veins" are readily operated. Thousands of laborers go through life and daily perform arduous physical tasks while suffering from some of these conditions which have not even been operated.

"Mental diseases" are not incurable. Indeed, the majority of mild mental disorders under proper institutional care can be marvelously improved. A course of military training, with the regular routine of army life, might be brain-savers to a large number of these.

"Nasal abnormalities" yield readily to surgery. Millions of civilians have had to resort to some assistance of this nature, without in the slightest lessening their physical or mental capabilities.

"Skin diseases" are almost uniformly corrected by salvarsan, vaccines, or other easily administered treatment.

"Defective teeth" and dental decay need only the intelligent appli-

cation of dentistry. This was proven when some fifty-nine-odd thousand Canadian recruits, who were rejected because of defective teeth, had their teeth repaired, and were then enrolled in regiments that afterward rendered distinguished service on the battlefields of France.

In "suspected" or even "beginning tuberculosis" it would seem almost criminal to send away men for whom the job of army or navy life is so ideally fitted. For these "suspects," if given a chance at the outdoor life, exercise, nutritious food, which is routine in the service, would almost inevitably respond. Thousands of youths now doomed to a consumptive's death might be saved, and the infection which they spread might be prevented.

It is evident that medical examinations preliminary to universal military or naval service would disclose evidences of a woeful lack of knowledge, or perhaps a criminal neglect, of rudiments of hygiene. Service in a spick and span army corps, or the biting ridicule of their fellows, would soon correct these deficiencies.

Out of sixty-seven graduates from medical colleges who applied to enter the medical department of the army, forty-three were rejected because of "tobacco heart." In the Canadian Navy three out of four recruits are declined because of physical deficiencies brought about by tobacco. Recruits could be instructed as to the effects of tobacco and alcohol. These lessons would have a powerful influence for good upon the entire community.

The total value of the general training, instruction and care the recruit would receive is too broad to be estimated.

One eminent English observer who saw the horde of flat-chested, sallow-cheeked "clerks" who were marshaled into "Kitchener's army" two years ago, and saw them again six months later, their muscles firm and hard, their cheeks full, remarked:

"This six months of physical training and discipline has regenerated England."

It would do the same for us.

"Mouths full of Trouble."

A DEQUATE dental care for children is the next step in social health work, according to Miss Laura E. Palmer, resident worker and head of physical work at the University Settlement, New York. Good health without good teeth is impossible, and a clear and terrifying glimpse into the bad conditions of children's teeth has been given Miss Palmer during and since the influenza epidemic.

"Mouths full of trouble" is the term Miss Palmer used in discussing her experiences and conclusions regarding the majority of mouths among poorer children.

THE COMPENDIUM

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A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

THE THERAPEUTIC EFFICIENCY OF ORAL PREPARATIONS.

ABOUT a year ago a great deal of discussion arose in our dental societies regarding the many claims put forth by the manufacturers of tooth pastes, powders, etc., as to their efficiency in preventing the destruction of tooth tissue. It became a subject of interest for many of our foremost research workers, consequently the reports of their findings were looked forward to with much interest.

One of the best summaries of the whole question was prepared by Herman Prinz, M.A., M.D., D.D.S.,* and will prove of interest to our readers. Dr. Prinz points out that it is an erroneous idea to suppose that mouth washes, tooth powders, tooth pastes, etc., even though non-poisonous and neutral in reaction, are indifferent to the oral tissues. Most tooth powders, pastes and certain mouth washes contain a high percentage of soap. On account of its alkalinity, soap invariably kills the important salivary ferments.

It is very important that we know the composition of any preparation before recommending it to our patients. For instance, potassium chloride was at one time considered to be an exceedingly fine constituent for a dentifrice. No mention was made, however, of its danger to general health in certain cases. Positive harm may arise if this substance is used too freely by certain types of patients. We ought to be cognizant of this, and use judgment when prescribing. Again, a metholated salol solution was advertised as the "most persistent oral antiseptic," yet this compound, says Dr. Prinz, is likely to produce persistent eczematous eruptions about the corners of the mouth. These are but a few examples chosen to show how necessary it is that dental practitioners use care when selecting preparations for continuous use in the mouth.

Many times our patients ask us to suggest some preparation that will remove tartar from the teeth, and we are at a loss to satisfy this

*Items of interest.

demand. Certain preparations are on the market, and are advertised as being efficient in this work, but actual tests prove them to be failures. We know that from its chemical composition tartar ought to be removed readily by the use of an acid or an acid salt. But these cannot be used in the mouth without causing serious harm to the tissues. "It is known, however," says Dr. Prinz, "that certain alkalies—the salines—prevent the ready formation of calculus, and they help to remove fresh deposits when brought in intimate contact therewith. Just how much of this destruction or removal should be attributed to the mechanical scrubbing of the brush, and how much to the solvent action of the ingredients of the tooth powder or paste, is not known at present. Nevertheless the salts of certain mineral springs, especially those of Carlsbad, are used in concentrated form for such purposes, and apparently with some success. Artificial Carlsbad salts may be incorporated into a paste with calcium carbonate and other abrasives; its only drawback is its disagreeable salty taste. Tooth pastes containing about 25 per cent. Carlsbad salt may be obtained in the market."

The history of the attempts at obtaining antiseptic mouth preparations is a long one, and dates back to the early days of dentistry. It has been found, however, that the most efficient preparation will show on an average only 50 per cent. of the oral bacterial flora inhibited. Skilful investigators of this subject have come to the conclusion that it is impossible to render the oral cavity sterile, even for a short period, with any of the so-far discovered antiseptic solutions.

A group of men prominent in dental research work have become notorious through advocating acid mouth washes as a prophylactic measure. One* suggests rinsing the mouth with diluted vinegar; another† recommends a solution of acid potassium tartrate. Regarding these theories Dr. Prinz has this to say: "Both recommendations are based on observations made in the laboratory; their correctness is not substantiated by clinical evidence. The recommendation of an acid mouth wash of the above type is based upon wrong premises because, first, the laity will not be induced to employ an ill-tasting mouth wash for any length of time, and, second, the pharmacologic principle evolved in the selection of such solution is erroneously applied. When an acid mouth wash in the form of vinegar or acid potassium tartrate is taken in the mouth, a temporary copious flow of alkaline saliva, rich in mucin, is produced. This alkaline saliva serves as a diluent and neutralizer of the acid, and the colloidal mucin acts as a protector of the insulted mucous membrane and the teeth—nature's method of getting rid of the irritant. In accordance with Heindenhein's law, forcible stimulation of salivary glands is followed by impairment of their function. Incidentally the acidity of these

*Gies.

†Pickerill.

solutions kills the important salivary ferments." A mild alkaline astringent, in Dr. Prinz's opinion, will reduce the oral flora quite as effectively as those of harsher reaction. A physiologic salt solution (approximately one drachm of sodium chloride to a pint of boiled water), heated to body temperature, reduces the oral flora to 50 per cent., and is absolutely safe. Again, good results are obtained through the use of well diluted lime water. The therapeutic value of lime water depends upon its solvent power on the mucin deposits on and about the teeth. It is just possible that an added benefit is derived from the protection afforded the teeth by the precipitated calcium carbonate. A tablespoonful (one half ounce) of lime water added to a tumblerful (eight ounces) of physiologic salt solution makes a most serviceable mixture which may be used as a mouth wash with impunity. Such a solution corresponds more closely to an artificial saliva—nature's protector of the teeth—than any other wash found on the market.

CANCER AND CLIMATE.

In a recent issue* of "The Dental Record" some interesting facts regarding the immunity to cancer enjoyed by certain northern tribes, are given by Mr. H. C. Ross (of the Clinical Laboratory of the Minister of National Service). Mr. Ross has had his views regarding the non-existence of this plague among these people amply confirmed by well known explorers and investigators, among whom is mentioned Mr. Vilhjalmur Stefansson. It is quite clearly established that among the Esquimaux, at any rate, no cancer exists. In his search for a reason for this condition Mr. Ross gives it as his opinion that the absence of cancer in the Arctic regions can have only one of three explanations—racial, dietetic, or climatic.

Now the Esquimaux racially are Asiatics and Asiatics are far from being immune to the scourge of cancer; so this explanation is not sufficient to account for the condition. On the other hand we have had some of our best investigators attempt to relate the prevalence of cancer as being due to a liberal meat diet; indeed many would treat this ailment solely by regulating the diet. But these northern people live entirely or almost entirely on meat; then why are they exempt? By the process of elimination we have left them only the climatic theory. Can there be anything of value in it? "If this be so," says Mr. Ross, "the parasitic theory of cancer takes on a new lease of life. For the Arctic cold is so intense that saprophytic organisms cannot exist; nothing putrefies if left in the open; and while contagious diseases are common, diseases which are contracted from the general atmosphere, such as 'colds,' are unknown." He suggests that cancer ought to be considered a disease that may be contracted from the atmosphere; an organism causing cancer in-

*May, 1919.

vades the body from without and is carried by the air. The severity of the Arctic climate is not favorable for its propagation.

This view certainly has the virtue of novelty and will be heeded with great interest by many; by bacteriologists, perhaps, most of all. If there be anything in this theory then no doubt the organism will be identified and isolated in time. The preparation of a serum would then be the natural outcome and this dreadful disease brought under control. Whatever else may be said of Mr. Ross' views it must at least cause many who would treat cancer by means of dieting alone to revise their methods. This theory is a new one and holds our interest even though we cannot fully endorse it.

THE CARE OF THE EYES.

Dentists on account of the peculiar nature of their work ought to give more thought to the care of their eyes. We know that along the edges of the lids are many hair follicles and oil glands that are easily subject to infection, yet think nothing of rubbing our eyes with our fingers even after handling infectious dental cases. Those who have investigated the subject have found that many of the minor ailments at least of the eye can be traced directly to infection from the fingers.

Having due regard for the importance of this question the Chicago Dental Society in November, 1918, asked Dr. C. D. Wescott, of Chicago, to read a paper on the care of the eyes. He did so and in the opening paragraph makes this alarming statement: "I have seen chancre, sporotrichosis, blastomycosis, and tuberculosis of the lids, all due to handling the lids, or rubbing the eye with unclean fingers. We should be very careful not to touch the eyelids without washing the hands, and at least twice a day we should bathe them with warm water and a good soap, followed by a dash of cold water."

Among the many things recommended by Dr. Wescott is the bathing of the closed lids two or three times a day. Cold water has a tonic effect upon the circulation of the eye, but we should not wash the eyes out with plain water. It is best to thicken it a little with boric acid, common salt, or borax—an isotonic solution is much more agreeable to the eye and just as cleansing as water. Hot water should not be used excepting under unusual conditions.

If we are unfortunate enough to get any foreign substance in the eye it should be removed with as much skill as possible so as not to cause undue injury. A wooden tooth pick, upon the end of which a little clean cotton wool has been tightly twisted, is a very effective instrument to use. If, however, the mote is not easily moved, the eye should be tied up immediately with a sterile dressing or a clean handkerchief, and the services of an expert obtained. Wounds of the eye must be encouraged to heal quickly and with-

out infection, otherwise the eyesight may be permanently impaired. Various forms of inflammations of the eye may occur, some due to external and others to autogenous infections. Focal infections, especially of the teeth and sinuses, play an important part.

One of the chief dangers for us to avoid is eye strain. A whole host of ailments have their origin in this defect. An early correction of abnormal conditions by the use of suitable adjusted lenses will not only relieve the strain but in many cases promote the normal growth of the eye. It is often found that in a few years the use of spectacles may be discontinued. Dr. Wescott says: "Physiological changes are occurring constantly, and the eyes should be re-examined from time to time, and the lenses readjusted to meet the changing needs of the eyes. All need glasses for near work at above forty-five, even if the eyes are normal, because of the changes due to age; and after that time the eyes should be thoroughly examined every two years."

When arranging our dental offices we should take particular care to have no glare or excessive light because these "cause irritation and congestion of the choroid and retina predisposing the eye to inflammation of these delicate structures with malnutrition of the lens, and the production of cataract. Indirectly there is much fatigue from retinal exhaustion and pupillary spasm. The remedy, it seems to me, is indirect illumination with light walls, preferably cream color or light gray, and a sufficient number of units to enable us to regulate the intensity of the diffused light. Of course such a plan is expensive as compared with direct lighting, but the saving in comfort and sight will make it pay."

The essayist warns us most strongly against any form of illumination which exposes our eyes to direct rays, especially from an electric lamp. Use day light as much as possible and where that cannot be had, then resort to diffused, indirect light as a substitute. Frequent rests and change of focus during the time that we are doing near work will tend to lessen the amount of eye strain.

THE USAGE OF THE TEMPERO-MANDIBULAR JOINT.—I believe with the essayist that the accepted ideas of the temporo-mandibular joint and of the importance of the condyle path are radically wrong. Also that the attempted measurements of the gyrations of the condyle are unnecessary and misleading. The idea that the mandible is a lever of the third class is erroneous. It is a mill with the molars and bicusps of the maxilla as the fixed attrition surface and the lower teeth as the movable surface of attrition guided into place largely by the cusps and inclined planes of the teeth. The ligaments and condyle are an outrigger apparatus to balance and stay the milling apparatus.—*Geo. H. Wilson, (Nat. Dent. Jour.)*

Personal Sketches of Canadian Dentists Who Served in the War

THE part that Canadian Dentistry has played in the world war is, in the aggregate, the personal experiences and worthy efforts of Canadian Dentists who served in the Canadian Army Dental Corps or other branches of the service.

Dentistry would like to know who these men are, and we urge upon every member of the profession, who enlisted in the C.E.F., to send to Oral Health the following information, immediately upon discharge from service:—

Name in full, with rank

Place where engaged in civilian practice

Date of graduation and name of college

Married or single

Date of enlistment

Date of discharge

Unit

Character of service, and other information of interest

.....
Photograph.

Every man should consider it as a duty to his profession to assist, in so far as he is able, in completing the dental record of the war. We appreciate the feeling of reluctance which all the men possess, when asked to speak of the service they have rendered. However, this very commendable diffidence should not be permitted to interfere in any way with supplying the information requested, to the end that a fairly complete history may be secured of Canadian Dental practitioners who served in the war.

Oral Health plans to publish a few of these "Personal Sketches" every month and we trust they may not only prove of great interest, but will be of inestimable value when Dentistry's part in the great war comes to be fully recorded.

In this issue we publish personal sketch of Lt.-Col. George Gow.
—Editor.

* * * * *

LIEUT.-COL. GEORGE GOW, C.M.G., HONORED
BY THE KING.



LIEUT.-COL. GEORGE GOW of Toronto, who served as a Dental Surgeon throughout the war, has been honored by King George and made Companion of the Order of St. Michael and St. George. Colonel Gow went overseas previous to the formation of the Canadian Army Dental Corps, attached to No. 4 University of Toronto Base Hospital, and following the organization of the C.A.D.C. was transferred to the Dental Corps.

Colonel Gow spent two years in Greece, and rendered splendid service to the Allies on that front. King Peter of Serbia conferred upon Colonel Gow the order of the White Eagle in recognition of service rendered the King and Serbian refugees.

Colonel Gow modestly disclaims personal credit for special recognition. The Dental Profession, however, feels that not only has the efficiency and skill of the Dental service been recognized, but that the services of a splendid officer have been graciously acknowledged. Canadian dentists, both civilian and military, sincerely congratulate Colonel Gow upon this honor. Colonel Gow joined the ranks of the Benedicts before leaving England, and is now the proud father of a baby girl. May he long be spared for service in his chosen profession.

Order of the British Empire Conferred Upon
Members of the Canadian Army
Dental Corps, Overseas

THE following appointments have been made to the Order of the British Empire, in recognition of service in the Canadian Army Dental Corps, overseas:

C. B. E. (Military Division):

Col. John A. Armstrong, C.M.G., Director of Dental Services, C.A.D.C.

O. B. E. (Military Division):

Lt.-Col. Wm. J. Bentley, C.A.D.C.

Lt.-Col. Claude Brown, C.A.D.C.

Lt.-Col. Orland Gibson, C.A.D.C.

Major Bayard L. Neiley, C.A.D.C.

Capt. J. L. Kappele, C.A.D.C.

M. B. E.:

C. S. M. McDerment.

School Dental Service in New York

THE General Welfare Committee reported favorably to the New York Board of Aldermen on the dental service measure and it was adopted on the 2nd July, 1919.

The ordinance follows:

"An Ordinance—establishing a Division of Oral Hygiene in the Bureau of Child Hygiene of the Department of Health.

"Be it Ordained by the Board of Aldermen of the City of New York as follows:

"Section 1. There shall be established a Division of Oral Hygiene in the Bureau of Child Hygiene in the Department of Health.

"Sec. 2. The purpose of such division shall be to establish and maintain such clinics and other agencies as may be necessary to secure for the children of the public schools adequate prevention and protection from dental deterioration and disease.

"Sec. 3. The grades of positions within the said division shall be such as may be from time to time determined by the Board of Aldermen upon the recommendation of the Board of Estimate and Apportionment and the Commissioner of Health.

"Sec. 4. The said division shall be organized immediately and upon its organization shall take over and operate the dental clinics now existing under the jurisdiction of the said Department of Health.

"Sec. 5. The said division shall immediately upon its organization proceed to establish at least nine additional dental clinics in those public schools where the greatest need is found to exist, and shall from time to time continue the establishment of such further clinics as may be found necessary to carry out the provisions of this act.

"Sec. 6. The Commissioner of Health shall include in the Department of Health estimates for 1919 a sum sufficient to meet the cost of the said division for the said year."

TO CLEAN BURRS.—Half fill a small glass vessel with a saturated solution of washing soda, into which drop the burrs after using. Soak for an hour or two, and remove *debris* with a suitable brush.

Post Graduate Course for Dental Practitioners Who Have Served in the Canadian Expeditionary Force

THE Royal College of Dental Surgeons will give a Post Graduate C.E.F., to be held in the College Building, Toronto, commencing 15th of September, 1919.

Following one week of intensive work, comprising lectures, demonstrations, and clinics, the members will be permitted to remain in the College Infirmary for any period they may desire.

Registrants are requested to name the subjects they would prefer to study during the Course. The Committee (Drs. Harold Clark, W. M. McGuire, F. J. Conboy, and Wallace Seccombe) will endeavor to meet the wishes of the members, so far as may be possible.

No fee will be charged, the Board of Directors having made an appropriation sufficient to meet the expenses of the Course.

Applications should be in writing, and received not later than the 25th of August, 1919. Address application to Wallace Seccombe, D.D.S., Superintendent, Royal College of Dental Surgeons, 240 College Street, Toronto.

DISEASED PULPS.—Diseased pulps give rise to our greatest problems. Whatever the evidence given by the radiograph, we may be sure that when opening the pulp chamber results in a discharge of foul gas and pus, the condition must be met with surgical procedure.—*John E. Nyman, Journal N. D. A.*

Obituary

DR. CHARLES L. STRICKLAND.

DR. Charles L. Strickland died in Charlottetown, P. E. Island, on Friday, May 16th, 1919.

Dr. Strickland was born in Bangor, Maine, in August, 1836, and almost completed his eighty-third year. When the American Revolutionary War broke out he recruited a company of which he was captain. Leaving the army in 1863, he in the same year opened an office in Charlottetown for the Practice of Dentistry, continuing until a short time before his death, almost completing fifty years of active practice.

J. S. BAGNALL.

Charlottetown, P. E. I.,
July 4th, 1919.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

ANOTHER USE FOR BUCKLEY'S DESENSITISING PASTE.—In those cases where you purpose to extirpate a pulp at a future appointment, prepare the cavity sufficiently to seal in this paste. Leave it in from three days to a week. At the next sitting apply the dam and, on opening up the cavity, you will be able to make a direct pulp-exposure with little or no discomfort to the patient. In this way you remove that great difficulty attending so many cases of pressure-anesthesia: That of obtaining exposure of the pulp.—*T. E. C. Butler, D.D.S., Toronto.*

FIXED OR REMOVABLE BRIDGE WORK.—The patient's interest in such work should be one of primary consideration when plans for the restoration are being made. The psychology of the problem will have to be considered, for a patient frequently refuses to accept the thing that is best for him, for no other reason. Many very good pieces of removable work have been condemned because the patient assumed an unfavorable attitude. He had previously settled the matter in his mind by selecting a fixed bridge. We must very carefully consider this attitude of the patient, for it may become morbid, and prove damaging to the practice of removable work.—*F. W. Frahm, (Dental Cosmos.)*

THE ANTRUM.—There is one condition that the dental, oral and nasal surgeons have to deal with. It is on the border line. I refer to suppuration of the antrum of Highmore. You men go in through the alveoli, while we go in either through the nose or canine fossa. We either do the Caldwell-Luc or the Denker antrum. I think that we have a better operation than the one that you men do when you go in through the alveoli. We can see what we are doing, while you do your work largely by the sense of touch. You drain through the mouth, while we drain through the nose. Your patient is liable to swallow a lot of the pus from the sinus, and ours blow it out. I know that there is room for argument in these conditions. What we all look for in any condition is drainage, and we want it to drain out and not in.—*J. M. Britton, M.D., in "Dental Summary."*

HARD PLASTER-OF-PARIS CASTS.—Such casts may be made without boiling them in stearin or wax. If one-third marble dust is added to the plaster while the mix is being made for the cast, the result will be a strong cast that will withstand heavy pressure and have a minimum expansion index.—*F. W. F. Pacific Dental Gazette*.

A FEW PRECAUTIONS IN CONDUCTION ANESTHESIA.—If all requirements of asepsis in connection with the anesthetic solution, the instrumentarium, and the field of operation have been satisfied, no untoward sequelae of any kind will follow the injection if it has been made into healthy tissue.

Injection in close proximity to a purulent centre must be avoided in all cases, since virulent bacteria may be carried into deeper layers. In cases of severe inflammation or abscesses, conduction anesthesia must be resorted to. Pain from secondary infection, due to faulty oral hygiene, must not be charged against local anesthesia.—*D. P. Synder, (Dental Cosmos)*.

CHURCHILL'S TINCTURE OF IODIN.—Churchill's tincture of iodine was originated by Dr. Fleetwood Churchill, the celebrated Dublin gynecologist, professor and author, for use in his practice. He knew that iodine was a strong antiseptic and also had an astringent action, and could be used successfully in gynecology. But he needed a "soluble and stronger tincture,"—one which would readily mix with water and not have the iodine precipitated, as is the case with the ordinary tincture. Dr. Churchill then made the addition of potassium iodide, which he found would keep the iodine in solution and prevent its precipitation, so that the preparation would be soluble in water.

The National Formulary, vol. IV., 1916, under the title of Tinctura iodifortior stronger tincture of iodine with the synonym Tinctura-iodine, Churchill, Churchill's tincture of iodine, gives the official formula as follows:

Iodine	.....	165 gm.
Potassium iodide	.....	33 gm.
Water	.....	250 c.c.
Alcohol	.....	to make 1000 cc.

American Journal of Pharmacy.

TREATMENT OF SOCKET AFTER REMOVAL OF ABSCESED TEETH.—Wipe out socket thoroughly with concentrated carbolic acid both in acute and chronic abscesses, not merely as a pain reliever, but because it thoroughly breaks up the sac (if any), or the remaining portions of it, and by its stimulating effect rapidly assists the healing process. The anodyne and anaesthetic effect is almost instantaneous.



“The Good Men Do”

WHEN Shakespeare made Mark Antony say, “The evil that men do lives after them; the good is oft interred with their bones,” he either did it for oratorical effect or else he fell far short of being the philosopher we have all given him credit for. The exact reverse is true. It is the good that is remembered, and the evil that is forgotten; which is a fact carrying with it a compliment to human kind. What is more appropriate than to have the beautiful mantle of charity thrown around us the moment death closes the chapter? In life we are aggressive, contentious, and usurping; trampling on the rights of others, and looking always for an advantage. In death we are acquiescent, submissive and non-resistant. We are defenceless—we make no protest—and it is the good that is in human nature which asserts itself at such a time and says that we shall not be maligned. Death is the great disarmers. All the good we have ever done looms up large in the consciousness of our friends; our virtues are magnified as we lie there mute and helpless. Praise does not puff us up, and so praise is meted out to us most lavishly. Our faults are forgotten, as if we never had them. Our good deeds are rolled as a sweet morsel under the tongue, and what in life had been taken as the ordinary and obvious is now heralded as the unique and sublime. Our helplessness shields us from the rancor which otherwise might rise against us, and we need no advocate in court when the world sits in judgment upon us.

Back across the years of life we had run counter to the will of others; we had raised contention and excited opposition. We took it as our birthright to intrude our point of view on the world, and we foolishly strove to force our ideas into the ascendancy. But death has given us absolution, and our faults are not held against us. Death pays all our debt, and leaves the score-card clean.

Would it not be well if the world were as charitable of men in life as it is in death? Why cannot we magnify the good in men while they still live? Why cannot we forget the ill?

Mayhap the discrimination in favor of death is a compensation of nature to make death less dreadful. Mayhap we would cling to life more tenaciously, more unreasoningly, if death were not the great softener, the great solace. Not that it is better to die than to live, not that the supreme destiny of man is typified by his death; but that when the ultimate tragedy comes it is comforting to know that it is mellowed by the memory of charity and loving kindness.

In life we are misjudged and maligned, in death we are understood and forgiven. The good that men do lives after them, which is surely incentive enough to make the man who thinks of it do all the good he can.

C. H. Johnson.

Recurrent Dislocation of Lower Jaw

TYING up the coronoid process or the tissues inserted on it to the zygoma is suggested by Blake ("Annals of Surgery," August, 1918) as an operation in these cases. This procedure is less difficult than any careful and accurate work on the joint itself, and, further, it acts to a much greater mechanical advantage, in that the coronoid is 3 or 4 cm. in front of the joint, and is by so much in a better position to withstand trauma tending to dislocation. A case is cited in which this procedure was employed successfully. An incision was made along the lower border of the zygomatic arch, and the fibres of the masseter separated from it. This incision was well above Stenson's duct and parallel to the facial nerve fibres. With some difficulty the coronoid process was reached; it was much deeper than had been anticipated, and Blake was not able to do what he had originally planned—this was to drill through the tip of the coronoid, thread a piece of silver wire through the hole, and lace this over the zygoma. He therefore looped the wire first over the zygoma and then brought it down and carried it through the insertion of the temporal muscle and the periosteum on the front of the coronoid, twisted the ends together, flattened it, and closed the wound without drainage. The wire loop was long enough to allow the jaw to open for 2 cm. or 1 inch between the incisors. The masseter was carefully sutured to its origin; bandages held the jaw closed, and the wound healed by first intention. The jaw was immobilized three weeks. More than a year after the operation, the jaw is normal and reliable in every way, the excursion being about 4 cm. at the incisors. —*Journ. A. M. A.*

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TORONTO, JULY, 1919

No. 7

EDITORIAL

“He Profits Most Who Serves the Best”

THE profession of Dentistry has gone through a great war and to-day stands upon a higher plane of usefulness and occupies a higher position in the estimation of the public. And why? Because many members of our profession were willing to sacrifice remunerative practices, home comforts, and the society of friends, in order to provide for the dental needs of our soldiers. And because of their public-spirited and glorious deeds, dentistry has been elevated and ennobled.

The great task of reconstruction awaits us. The war has meant much to the manhood of Canada. Thousands of our bravest and best citizens,—men who left home with every possibility of body and mind intact, each nerve and muscle thrilling with the glow of health,—will never return. These heroes are dead. They died for liberty. They sleep in lands far distant and we at home enjoy the liberties they bought at so great a price. They have given to us a priceless benefaction. Shall we not then make some contribution for the welfare of our fellows, remembering that each *right* guaranteed has its corresponding *duty* and each *opportunity* its own *responsibility*?

It is for us, now, highly to resolve that for every life given on the battlefields, for every body warped or maimed, a thousand young lives shall be raised into fuller freedom and health. This is to be our

living memorial to the men who died in the cause of democracy. Only by so doing, will our profession be worthy of those monuments which mark in distant lands the last resting place of those whose sacrifice has been complete and who will return to us no more.

Lives are being needlessly sacrificed, human power in enormous quantity is left wholly or partially undeveloped, economic loss to staggering extent occurs, because of the ravages of dental disease. The great majority of the people, (even the intelligent people,) fail to appreciate the significance of these defects. Their ignorance, however, does not prevent the penalty of injury from falling relentlessly upon the lives of our boys and girls.

The Department of Education, Province of Ontario, through the Director of Dental Services has requested each dentist to give a few half days to assist in making an initial dental survey of all the school children of the Province. The object is to gather official statistics which will lead the proper municipal authorities to establish permanent systems of dental inspection and treatment. This survey will not be conducted until the fall season but as a vast amount of organization is necessary, it is essential that those who are willing to help, send in their names at the earliest possible moment. A large number of the men have already signified their willingness to assist in this most laudable undertaking, but why not accomplish this work in the shortest possible time and with the least expenditure of time on the part of each Inspector by having every member of the profession volunteer to assist? Then the work could be easily planned, each dentist would be working in his own district and dentistry in Ontario would successfully accomplish a task never before undertaken in any Province or State. The profession demonstrated its loyalty during the years of war. Shall we not now further show our loyalty during the period of reconstruction by coming to the rescue of the boys and girls,—those who are unable to protect themselves, but who in a few short years will be men and women and shall be called upon to take up the duties and responsibilities of citizenship.

Proper Breathing

“**P**ROPER breathing should include both the diaphragm and the intercostal muscles. Lack of use of either of these sets of muscles involves the sluggishness of the underlying air cells, with stagnation of their contents and disease of these tissues. Healthy lungs cannot be secured without the use of all the muscles of respiration. Full, deep breathing aids in the digestion of the food and in the circulation of the blood, besides supplying the proper amount of oxygen to the tissues and carrying off the waste matter.”

Democracy * *

Make the world safe for
Democracy. * * * *

Certainly! But why not
make Democracy safe for
the world? * * * *

*School Dental Service
will help a whole lot. **



FRED J. CONBOY, D. D. S.

*Supervisor of Dental Inspection for the Province of Ontario.
Dr. Conboy is an ex-chairman of the Toronto Board of
Education and has held many important positions
in connection with social-welfare work.*

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, AUGUST, 1919

No. 8

Fixed Versus Removable Bridgework

ANOTHER man has "crossed over the floor." Dr. R. Ottolengui announces that during the past five years, a close study of the principles involved has caused him to conclude that fixed bridgework has no legitimate place in dental practice.

The average dental practitioner of some years standing will doubtless heave a great sigh and ask "Well! What next?" One after another of his old and trusted props are twisted, bent, or broken. The modern dental practitioner is sometimes led to wonder just what is really left of all the methods of practice, approved but a few short years ago. However, notwithstanding the heart burnings and the uncertainties, the sooner our "props" are discovered and removed and Dentistry rests her feet upon rock bottom foundation the better for both the profession and the public.

The destruction of idols is an unusually healthy pastime and bespeaks progress and virility. Dentistry has recently been discovering many "feet of clay." We are certainly disappointed and chagrined but there is no cause for discouragement. Though much has been destroyed, much more remains and the remnant is of a character upon which the more scientific dentistry of to-morrow may be built.

Dr. Ottolengui has taken occasion to say:

"Either the general practitioners of dentistry have already shown that they do not possess the requisite skill and innate ability to practise fixed bridgework, or else the disciples of this type of work will shortly be compelled to admit that fixed bridgework is wrong in principle. One horn of this dilemma the fixed bridgework man must ride, for we will soon prove that fixed bridgework, as practised in this country to-day, is septic dentistry."

"Does not the dental fixed bridgeworker overlook the fact that the engineer of real bridges always relieves stress on his abutments by a 'break' in the bridge at some point? *Vide* the bridges across the East River and then indicate where and how the dental fixed bridgeworker has provided any similar protection to his abutments. Has any fixed dental bridge with two or more abutments ever provided for expansion and contraction? For movement under stress? Real bridges constructed as are dental bridges, would tear out rocks from mountain sides. That such disaster is not sooner met in dental bridgework is because of the movability of the abutment itself, through its pericemental investment. But, let the fixed bridgeworker take no comfort from that fact. The mobility of a root in its socket is a wise provision of nature against all stresses that may reach the root or roots that support a single crown, and never was planned to endure and withstand the added loads that would reach the root or roots through other crowns attached fixedly thereto."

The occasion of the discussion was a paper published in May *Dental Items of Interest* and presented by Dr. Jas. Kendall Burgess before the King's County Dental Society in March, 1919, and in which Dr. Burgess defended the insertion of fixed bridges. In answering arguments against fixed bridgework Dr. Burgess said:—

"Now I have reason to believe that it is not about the crowns of the teeth that my friend is concerned, but about the roots that move in function, and a short-sighted Providence that made no provision for taking out the natural denture for the purpose of cleaning it, has lost sight entirely of the necessity for individual in-every-direction root movement and has bound the two lower molar roots together under a single crown, and, worse still, three under the uppers! And if Providence did not care any more about it than that, why, I do not!

"There is ample clinical evidence to refute any theories about the dire results of uniting two or more teeth with a properly planned and constructed bridge, as Nature has united the two or more roots of one tooth. 'All is grist that comes to my mill.'"

Dr. Ottolengui contends that Dr. Burgess has here used sophistry where the purest logic is needed, and claims that Dr. Burgess is in error. Dr. Ottolengui argues the case against fixed bridgework and proceeds: "Nature never did 'bind the two lower molar roots together under a single crown, and worse still, three under the uppers.

"In fixed bridgework, the dentist does select certain separate roots and does bind them together with his fixed appliance. Nature works conversely. She produces the crown first, and then as an outgrowth from that crown she grows a root; not two nor three roots, but just one root. The form of this root will vary exactly in response to the demand that will be placed upon it by the stresses of

mastication received through the crown which this root supports. Thus this root may be conical in shape, even under a molar, or bifurcate, or trifurcate; but is always a single root, with only one source of nutrition, one pulp, straight, bifurcated or trifurcated, and one single continuous pericementum,—a pericementum so continuous and so elastic that as the crown, during the stresses of mastication, is moved vertically, buccally, lingually, mesially, distally, or in any other direction in its socket, this pericementum acts as a resilient cushion which completely obviates all dangers or damages resulting from what otherwise would be trauma.

"No! There is absolutely no analogy between the bifurcated or trifurcated root which supports a single molar crown, and two or more separate and separated roots, bound together by a dentist and made to support several crowns.

"Nor is there any analogy between a so-called two-rooted or three-rooted molar, the roots of which support only a single natural crown, and these identical roots required to support several crowns.

"Nature may utilize two or three roots (if you wish so to phrase it) for the support of a single crown; this is use. But when a dentist utilizes these same roots to support two or more crowns, that is abuse."

In discussing the hygienic phase of the question Dr. Burgess said:

"I read in writings of the removable bridge advocates that the patient can take his bridges out and boil them. Fine! And boil the abutments and the other natural teeth in the mouth, I suppose! No? What then? Brush them and use floss silk. I see! The brush and floss silk are fine for the natural teeth, but would never do at all for a dummy. You say you can't get at them? Well, if you would use a small proportion of the time and thought and everything else that you are putting into your removable bridges, you could make your fixed bridges so you *can* get at them. It can be done!"

While in these words Dr. Burgess presented the hygienic argument for the Fixed Bridge, he might have gone further, however, and discussed the case of the patient who gives no care whatever to the cleanliness of the mouth and persistently *fails to remove the movable piece for cleansing*. Such a restoration in such a case is doubtless worse, from the hygienic standpoint, than a fixed restoration. However in such cases, the fact is that no restoration whatever should be made until the patient has acquired the habit of the daily care of the mouth.

The discussion of Dr. Burgess' paper by Dr. Paul R. Stillman of New York, is of such interest that we quote it at length:

"Our essayist says that it seems incredible to him that the men who make various kinds of removable restorations still persist in

calling them bridges. And I heartily agree with him; but I also think that it is equally inappropriate to term the fixed appliance a bridge. If you must use this term "bridge" why not call the fixed restoration just "plain bridge" and the removable one "draw bridge." It seems to me that the nomenclature of the specialists in bridgework is rather crude, and quite unscientific. When the once so-called "pyorrhea specialists" were called everything from "Peoria specialists" to "diarrhoea specialists," we got together and formed a national society, just as the orthodontists had already done. It is called the American Academy of Periodontology—(a rather long name perhaps for the bridgemaker's tongue). Among the first things this society did was to appoint a nomenclature committee. As a result we have added over thirty new words to the latest medical dictionary. Now, when we write or discuss our subject we have a common language with scientific terms which we all understand.

It is my gratuitous suggestion that the so-called "bridge specialists," or the men who have lent their names to the advancement of this work, get together and agree to make the word "bridge" obsolete in dentistry. When this is done there will immediately follow a broadening influence upon your science. Most of the medical words are of either Greek or of Latin derivation, and a good Greek root word or combination of words which would describe "a restoration of one or more teeth" in contradistinction to a restoration of a part of a tooth, would be a valuable as well as cultural acquisition to dentistry.

It is as silly to argue which is the better, a fixed bridge or a removable bridge, as it is for one man to argue that his wife is more beautiful than the wife of his friend. Bridges of all descriptions—like the women of all races—are occasionally—which shall I say, "good" or "bad"? Dr. Burgess desires that I go on record; I know he does.

In the twenty years, more or less, of my practice, I have observed much bridgework. I have observed bad bridgework, and by bad bridgework I refer to the bridgework from any and everyone's hands, both the exquisitely executed and the crudely thrown together type, fail. By fail, I mean that the tooth roots upon which they depended for their retention in the mouth became diseased; that the pericementum died from infection due to irritation, caused by the bridge itself. I have observed any and all types upon occasions, and even the most exquisitely made bridges will produce and contribute toward disease of the periodontal tissues. I have seen removable bridges, which were beautiful in the perfection of their execution, ruin a whole mouth, and within a comparatively short period of time have to be removed (roots and

all), and a full upper denture made to replace them. These removable or "draw bridges," as I have facetiously called them, may, if the patient so desires, be taken out of the mouth and cleaned. And in this respect alone I contend that they are better and more sanitary than those of the fixed type. But the fixed bridge which is constructed upon the principles which the essayist has laid down, may also be kept sufficiently clean to be unobjectionable to a periodontist.

To construct an ideal removable bridge which is correct in every detail, requires a better artisan than does the fixed bridge. I venture that any good removable bridge worker can excel the fixed bridge worker in the making of a fixed bridge. He has more ability as an artisan. But it is not in the beauty nor the crudity of any piece of dental restoration that its greatest weakness lies. A fixed bridge, or a removable one, may be beautiful in the mouth or on the laboratory bench, and yet prove a consummate failure after it has been worn less than one year. "A man may smile and smile and be a villain," and this is also true of bridges. The secret of a good bridge is in its relation to the teeth in the opposite jaw—the occlusal relation. And just so long as a bridge is made from an impression which includes just a segment of the jaw, and the whole set upon a hinge articulator; just so long as no attention is paid to the vital principle of co-ordination with the occluding teeth when the piece is cemented in the mouth; just so long as it has no relation to nature's laws, nor to the function which it is intended to assume and to restore, it makes no difference whether it is fixed or removable or "movable-removable," it will prove to be a disease-producer when worn in the mouth.

And now that I have decidedly approved of fixed bridgework which is made with the ideals as laid down by Dr. Burgess, I desire to say a word on what I think of the kind of work that Dr. Chayes is advocating. I will say it in a few words—far less than the subject deserves. It is this: The inlay bridge which Dr. Chayes has brought out, which is removable and which is attached to vital teeth, is, in my opinion, the most advanced step in bridge-work that we have to-day, for it complies more nearly to all of the demands of our science, than does an equally well-made fixed bridge. Vital teeth may not always have healthy pulps, but vital teeth never have septic canals. Removable bridges may be thoroughly cleaned, and this is very important. This is not universally true of the fixed bridge.

It is my opinion that Dr. Chayes rather overestimates the importance of the "movable" in his "movable-removable" designation. Movable teeth, to me, mean diseased teeth. They always mean disease when the natural teeth are as movable as the Chayes

"movable" removable bridges which I have seen. If there is marked mobility of the removable part of a bridge I would consider it a positive defect in the occlusal co-ordination. This criticism does not modify my approval of the slight ability to change position of these supplied teeth in this system of restoration, and I can conceive that it would relieve a great strain when they were threatened with fracture by a sudden closing down upon a bacon rind or a small piece of solder which has been lost among the contents of some tinned foodstuff. I do believe that the movable feature, however, lessens the mascerating ability of these teeth in the function which is expected of them.

Some one should write a manual of the necessities demanded in bridgework. The subject of "what not to do" is just as important in bridgework as in all other departments, and the average bridge which comes to my hands is usually a concrete example of what one should not do in bridgework."

In closing his paper Dr. Burgess said:

"There is ample clinical evidence to refute any theories about the dire results of uniting two or more teeth with a properly planned and constructed bridge, as Nature has united the two or more roots of one tooth. "All is grist that comes to my mill." When teeth fail under a bridge the operator under whose observation it comes is prone to look for the cause of the failure in the plan or detail to which he has the greatest antipathy. So, to the man who wants to wiggle his teeth as he wiggles his toes, all the ills that flesh is heir to are due to the circumscribing of this particular form of activity. But even to those to whom this function seems of paramount importance there need be no bar to the simpler and nearer-to-Nature bridgework. There are ample means of providing freedom of movement at the points of attachment, which add almost nothing to the details or difficulties of technique. (My confrere, Dr. Simon Shapiro, has shown such a bridge in the clinic which immediately preceded this meeting.) In truth, all the so-called objections raised against fixed bridgework have so little foundation in fact; all the disadvantages claimed against it are so easily overcome, all the fancied points of superiority of removable bridgework are so dearly bought and there is so much greater compliance with Nature on the part of properly planned and properly constructed fixed bridgework, where bridgework is indicated at all, that it seems to your essayist the time must shortly come when the present hysteria will give place to sober second thought, and we shall all be seeking to adhere to Nature and imitate and foster her instead of violating her very fundamentals in our worship of the false gods and fetishes which so dazzle the eyes and confuse the minds of those whose innate abilities render them capable of the largest service."

The Royal College of Dental Surgeons

THE School of Dentistry of the Royal College of Dental Surgeons of Ontario is unique among the Dental Colleges of the world, because of its being owned and administered by the Dental profession. The Board of Directors, elected by the profession, not only appoints the Faculty and administers the School, but also performs the function of Provincial Examining Board. Those wide powers have been delegated to the profession by the Legislature of the Province. The remarkable advances of the past, and the lack of public criticism, indicate the wisdom of the founders of the College, and testify to the public-spirited work of the members of the Boards that have controlled the destinies of the College since its inception fifty-one years ago.

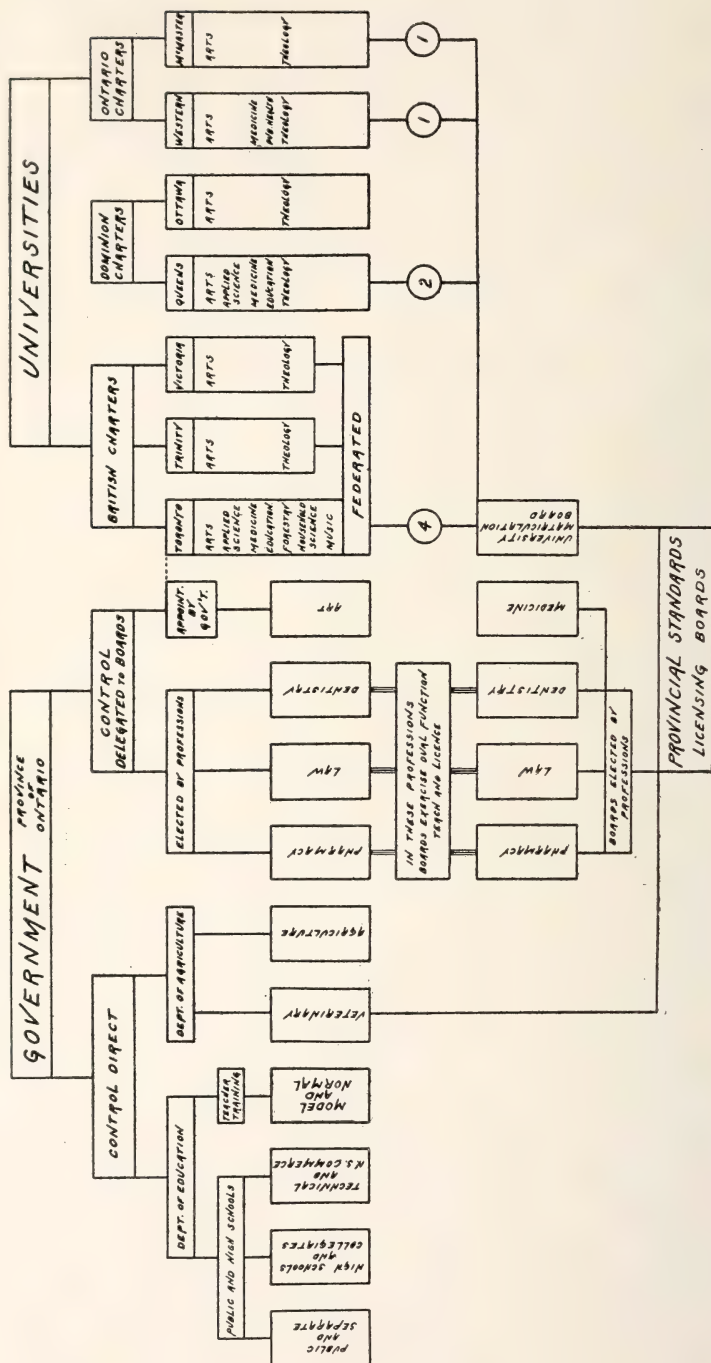
The plan of having one Board exercise the dual function of teaching and licensing has avoided the serious dissensions which have arisen in other directions between teaching bodies and licensing boards. It has also prevented needless and wasteful duplication of teaching facilities, such as has occurred in some Universities within the Province of Ontario, particularly in connection with Medicine and Applied Science.

Technically speaking, the Royal College of Dental Surgeons is owned by the Dental profession, but no dentist in the Province would seriously think of claiming any part or share in the two hundred thousand dollars of assets of the College. The College is properly considered as a public trust. The affairs of the institution are administered as such, though not a single dollar of public funds has ever been contributed towards its upkeep. The College has been entirely self-supporting.

The unusual demands of modern Dental Education for extensive technical and scientific apparatus, and the heavy expenditures incident to war conditions, have led the Royal College of Dental Surgeons to depart from its time-honored policy of independently carrying its burden without Government help, and at the last session of the Legislative Assembly application was made for a grant to assist in extensive building plans. Disposition of this matter is still pending, but owing to the pressing need the College has decided to immediately proceed with building operations entailing an expenditure of over sixty thousand dollars, exclusive of laboratory fittings and teaching equipment. It is expected that the Ontario Government will make a substantial grant toward new and necessary equipment, that the College may not be hampered in its work through lack of the most modern and ample teaching apparatus.

The application of the R.C.D.S. to the Ontario Government has raised the whole question of the relationship of the Dental College to

EDUCATIONAL ACTIVITIES WITHIN THE PROVINCE OF ONTARIO
RELATIVE TEACHING AND LICENSING BODIES IN PROVINCE



the Government and to the other Colleges and Universities of the Province. The accompanying diagram illustrates present conditions in the Province of Ontario. It will be noticed that of those professions requiring a license to practice all except Medicine are controlled by a Board exercising the dual function of teaching and licensing. This has prevented conflict between the teaching and licensing bodies, and has also prevented needless duplication of teaching faculties within the Province.

The Royal College of Dental Surgeons, while reserving absolute freedom of action, enjoys University privileges through its affiliation with the University of Toronto. The most cordial relations exist, and the co-operation is such that the decisions of each body are honored and recognized by the other. By the appointment of a joint Board of Examiners, duplication of examinations is avoided, and the examination records are available alike to both institutions. In this connection it is interesting to note that the regular College auditor is employed to make an audit of all examination papers and returns, with the same care and accuracy as in making the audit of the financial transactions of the College. So far as is known, this is the only College in the world where examination returns are given an independent audit by a firm of chartered accountants, but the results fully justify the expenditure thus entailed.

Relation of Dental Affections to Systemic Diseases

BY ALFRED STENGLE, M.D., PHILADELPHIA, PA.

(Lecture delivered before the Pennsylvania Association of Dental Surgeons, Philadelphia, April 8, 1919.)

I WAS asked by your president to discuss the relation of dental affections to constitutional diseases. Before beginning with the subject-matter proper let me direct your attention to the question of fads and fancies in medicine. I have been long enough in practice—as this month will complete my thirtieth year—to have seen many changes in my profession, as well as in yours; and I want to go back over a few things that have arisen and suffered material changes in the time since I first began my career as a medical man.

SURGICAL FADS.

When I was a medical student we were just emerging from that era of gynecological surgery when they burned and amputated the cervix uteri for all kinds of ailments, mainly nervous diseases; but

that practice had practically died out when I came on the scene. I do not think that, in my student days or afterward, I ever saw this done except for active disease of the cervix; but to amputate or mutilate a relatively normal cervix for the supposed effect on general, mainly nervous, diseases, had passed away.

We were, however, in the midst of a much more serious assault on womankind; because it was just in the beginning of the most detestable period of ovariectomy, when bushel-basketfuls of normal ovaries were gathered in by some of the surgeons of the day. Many lived to regret bitterly that they had lent themselves to a fad that had not been properly weighed and scientifically considered. What has been left of that? Why, there has been left the operation of removing ovaries when hopelessly damaged and diseased; but the removal of the normal organ, except for some disease of a special character, is of the past. We were, however, in the midst of that era at the time.

Then came the appendix era, and the number of normal appendices that were shed at the behest of our surgical friends was as voluminous as that of the ovaries in the ovariectomy period just preceding it. There was a time when for a mere medical man like myself to have asserted to a surgeon that there was some doubt in my mind as to whether an immediate incision should be made in the right iliac fossa and an appendix taken out, because that patient had more or less severe stomachache, would have laid me open to criticism, and perhaps abuse. That period passed. What has been left? The conclusion of doctors and surgeons alike that a real affection of the appendix calls for surgery, and that problematic disease of the appendix is a matter that should be weighed and considered carefully before operative interference is even suggested.

These are three conspicuous examples that even a layman will recall, of fads that were ridden to death. Undoubtedly they did a great deal of harm to various individuals in the community; although out of them there came, except in the case of the first operation mentioned, a great good to medical as well as to surgical practice. Reformers are always extremists, and we must beware how we take a reformer for our guide in the ordinary procedures of life. We should treat him as Polonius advised his son to do. We should lend our ears, listen to what they have to say, and reserve our judgment. But worse than these are those who are not reformers, but imitators of reformers, who often go a step farther than the man who has had the first conception, and these are they who often carry good things to ridiculous extremes. When I see in a popular magazine the alleged story of a celebrated personage, recently dead, who was known to have been subjected to a violent

general infection and was left an invalid and did not wholly recover, and see paraded in the magazine article an account of how an abscess around the root of one of his incisor teeth was the cause of all his difficulties and his untimely death, I think that a halt should be called on this subject, important as I consider it to be. Important though it is, there is great danger that much harm may come from reckless exploitation before sane views have clarified the atmosphere.

RECKLESS SACRIFICE OF THE DENTAL ORGANS.

It was not right that so important an organ as the ovary should be sacrificed, unless there was good reason for it. It was not so serious that people lost their appendices, except that some suffered from it physically or financially. But to sacrifice teeth is a very serious offense unless we can show good reason for it. If some of those who are over-enthusiastic had their way, the world would be a race of edentulous creatures—and what would become of your profession, gentlemen? After the eruption of the second teeth, your work would soon be done. All you would have to do would be to make plates!

I saw, a few years ago, a young woman who had organic disease of the heart, a mitral regurgitation. She had consulted a dental surgeon, who, I believe, regards himself as a specialist on the subject of root infection and similar conditions, and he had told this young woman she was in serious danger of having a reinfection of her already damaged heart, and would possibly perish unless she got rid of her teeth. I make due allowances for exaggeration on the part of this young woman, though I know of no one in whose trustworthiness I should have greater confidence. She said he insisted on the removal of all her teeth—as healthy-looking a set of teeth as I have ever seen. She has now been in France for four years, and has done an enormous amount of the most trying work, under the most trying circumstances. She has been at the very front—was at the front before our soldiers were over there—and she is still at the front, and has never suffered even inconvenience, much less those dire consequences that were foretold.

This is a long preamble, but it seemed necessary because we hear a great deal of loose talk about the teeth and the desirability of getting rid of them.

HISTORY OF OUR PRESENT CONCEPTIONS: WM. HUNTER'S VIEWS.

Now, to come down to the topic itself: If we go back twenty years we find descriptions in medical textbooks of certain diseases that are no longer recognized nor referred to in the textbooks of the present day. I was brought up, and some of the rest of you, no

doubt, also, at a time when we talked a great deal about "simple continued fever" and "ephemeral fever." They have disappeared from textbooks. Why? Because at about that time it began to be recognized that these were not distinct diseases, but merely the expression of infection somewhere in the body. That was the beginning of the thought that local infections might be the foci of disseminated infection simulating general diseases like typhoid fever. After a while various parts of the body were recognized as favorable seats for such local and hidden infection; among others, the region of the appendix, the pelvis of the kidney, the gall-bladder, the seminal vesicles, the prostate gland, and the bursæ around joints. Eventually the accessory sinuses connected with the nasal chambers, the tonsils, and, last of all, the roots of the teeth, came to be looked on as sites where one might expect such focal infection.

Before, however, the importance of focal infection was much discussed, there was a good deal said (and this applies to my student days) about the effect of dental conditions upon the general health, in another sense; that is, that bad dentition leads to bad mastication, bad mastication to under-nourishment. It was also thought that infected conditions in the mouth, such as gingivitis, might lead to the swallowing of pus with the food, thus producing gastro-intestinal and perhaps general infection. It is only recently that attention has been paid to the roots of the teeth as localities from which general infection could occur. One of the first persons who called attention to the possibility of dental conditions being the underlying cause of joint disease was William Hunter of London. A number of years ago, in the *American Journal of the Medical Sciences*, he wrote a paper which greatly impressed me at the time. In it there was mentioned the case of a woman who had begun to suffer with arthritis of the deforming type; and Hunter found, under the plate of her artificial teeth, a badly ulcerated condition. He removed the plate, treated the ulceration, and was gratified to find that the arthritis almost immediately began to vanish, the patient being finally cured altogether. That was the first definite pronouncement of the relationship between dental conditions and chronic joint troubles, so far as I know. Hunter extended his views in later years, and is nowadays more especially known for his views concerning the relation of the mouth to pernicious anemia. In his opinion, there is a disease of the tongue, supposedly a specific infection, that is the underlying basis of pernicious anaemia. This last is a little foreign to the present discussion, but I wanted to mention it as bearing on the question of focal infection.

After Hunter, others pursued this question of the relation of mouth infections to various kinds of disease. Regarding the types of infectious disease in the mouth I hesitate to speak, for I shall ex-

pose my ignorance to you—who, of course, know about these affections in a far more detailed way than I have any means of knowing. But, looking at the matter roughly from the average medical man's standpoint, we have to deal with cases of superficial infection, conditions like gingivitis or pyorrhea, and with the deeper infections more properly designated as root abscess. The former of these are much less important so far as the general condition of health is concerned and are far less frequently the source of generalized infection than are the deep-seated, hidden, and incarcerated abscesses about the roots of the teeth.

SYSTEMIC INFECTIONS OF ORAL ORIGIN AS RELATED TO THE PERIOD OF LIFE.

Now, the oral infections, if I may use the larger term, that give rise to general infections of the body are different at different periods of life. You will see few cases of general trouble, or the diseases which I am going to enumerate for you, from the conditions about the teeth in childhood and early life, as compared with cases due to infections about the tonsils, in the pharynx, and perhaps in the accessory sinuses. When anyone tells me that he has, in a young person before the age of thirty or, still worse, before that of twenty, a case of general infection due to a root abscess, I immediately grow skeptical; but, on the other hand, in the involutional period of life, in the forties, fifties, and sixties, root abscesses become increasingly important. Infections of the soft tissues are most to be apprehended in youth; it is infection of the alveolar process that we should look for as the age of forty is passed.

With regard to the particular diseases that are due to oral or dental infection, I could, without any misstatement, enumerate infective inflammation of practically every part of the body, and sundry other conditions recognized as attributable to infectious toxemia. One of my friends asked me recently to read the manuscript of a textbook article he had written on the subject, and I found that he had made just such an enumeration—one, indeed, that might have formed a first-rate index to a textbook on medicine. I wrote that I thought it would be better for him to pick and choose from among these many possible conditions those that were important or common. So it is the things that have importance because they are serious conditions, or because their dependence upon hidden sources of infection are apt to be overlooked, that seem to me specially worth mentioning. Among these I desire to speak particularly of the following:

I. Chronic anemia.

II. Chronic arthritis.

III. Chronic nephritis—Bright's disease.

IV. Myocarditis; that is, weak heart.

V. Recurrent or relapsing endocarditis—or infection of the heart valves.

I. CHRONIC ANEMIA.

Chronic anemia is a disease that, until comparatively recently, was not very clearly understood by medical men. In the books published up to ten or fifteen years ago, "chronic anemia" was put down as a definite disease somehow dependent on a vice in the blood-making function, but without any clearly recognized cause. Now we search for causes, and know that chronic anemia is usually secondary to some poisoning, infection, or obscure loss of blood going on in the body. We have all seen individuals in our families or among our friends, who would repeat the familiar formula—"I was always fed on iron since I was a little girl." These are the cases put down as "chronic anemia," and cases in which to-day, among other causes we ought to be searching for focal infection. When we deal with those beginning in childhood we are likely to find that they are due to tonsil or sinus infection, or infections of some part of the pharyngeal cavities. Later in life, when we see an indefinite anemia even approaching pernicious anemia in type and severity we shall not infrequently find it due to root infections. I have seen some very notable examples of this sort of thing and want to allude to one—a very striking one.

A number of years ago I was asked to take charge of a lady who was returning from Europe. She had become very ill in Florence, and had got worse and worse; they had called in celebrated physicians, who studied her case and decided that her manifest anemia was due to cancer of the stomach. Her son then went to Europe and took her to Carlsbad, where the diagnosis was confirmed. She continued in about the same state, and it was finally decided to bring her back to America. I do not think I have ever seen a more anemic-looking person than she was when she arrived. She was as white as chalk, and had a hemoglobin percentage of less than 30. After some study I concluded that she did not have cancer of the stomach; but she did have some very bad root abscesses, which had been discovered in London, just before they brought her to this side. These were cleared up by removal of the teeth, with the result that there was an extraordinary improvement almost immediately, and eventually a return of her blood to normal. She was then almost seventy years of age, and lived several years longer.

There are many elderly people who have not a disease that you can give a name to, but who are in a chronic state of ill health. They are, as a matter of fact, suffering from focal infection somewhere in the body. These people are usually anemic. They have what

we call technically a secondary anemia. It is important to search for the cause—in the oral cavity, among other places.

II. CHRONIC ARTHRITIS.

The second condition I mentioned is chronic arthritis. This is sometimes, as Hunter first showed, due to focal infection; but all arthritis is not, by any means, due to that. Our first knowledge of the relation of the mouth to arthritis was the discovery made that true articular rheumatism is commonly due to infection entering through the tonsils. That the forms of chronic arthritis called "deforming arthritis" are frequently due to oral infection is undoubtedly true; but a belief that this is the invariable cause may lead to errors of interpretation. It may, for example, lead the physician to the hasty conclusion that a certain case of chronic joint disease is deforming arthritis, and infective in nature, when as a matter of fact the joint disease is gout. Every person with deformed joints has not chronic arthritis, and gout is not an infectious disease. If we have the idea too strongly in mind that there is a bad tooth or an oral infection whenever we see joint trouble, we are likely to subject patients to needless extractions or other surgical procedures.

III. CHRONIC NEPHRITIS.

The text books are not very clear as to what causes many of the cases of chronic nephritis. The layman thinks it is largely due to heredity and very commonly to alcohol. The latter is a gross injustice to nephritics, because alcohol is by no means the all-important factor. Heredity, also, is an overworked theme. Modern investigators are beginning more and more to believe that chronic kidney disease is usually secondary to infection. We see this unmistakably in a person who has had scarlet fever and developed acute kidney disease from which he never entirely recovered, the nephritis having become chronic. The same is true in the case of pneumonia; but what we have not seen clearly is the origin of the cases of Bright's disease in which the patient comes to the physician without a history dating back to any acute infection. It is gradually dawning on the profession of medicine that a large proportion of these cases are due to the gradual effects of infection—not to one huge assault, but to repeated small insults, little disseminations of infection, day after day and week after week. Each one injures the kidney, the great excretory organ of the body. The kidney is more and more damaged until the nephritis becomes obvious in the way of symptoms, and the patient consults a physician. Nothing is found in the history to indicate an initial severe infection; but there is good ground for believing that many cases, if recognized early enough, studied and treated from the point of view of focal infection as we study and treat cases of chronic arthritis, would be cured.

A gentleman once consulted me with this story: He was a lawyer in the central part of the state. He had gone to Hoboken to meet his son, who was returning from Europe. At that time he was in average health, as far as he knew; but as he was walking down the pier toward the steamer, he suddenly felt a pain in his back—and from that time on was a sick man. It was a year later when I first was brought into the case. He had lost forty or fifty pounds and his blood was reduced to 50 per cent hemoglobin. He had the pain in his back, which was thought to be pleurisy and which he subsequently found to be due to arthritis of the vertebrae, with pains running along the intercostal nerves; he had albumin and casts and a high blood pressure. We found a wretched condition of the mouth. His teeth were literally swimming in pus. All of the tooth sockets were enlarged by the ulcerative process. We made X-ray studies of his teeth, and I had not the slightest hesitation in saying, "Take every one out." This was done, and in the course of several months the man recovered completely. He regained his weight and had no further symptoms of his vertebral arthritis; his blood returned to normal condition; his urine cleared up, and his blood pressure is now normal. This was a case in which the kidney disease was unquestionably a direct result of infection disseminated from the mouth.

IV. MYOCARDITIS.

Most people as they grow older have a weaker circulation. As we pass the half-century mark we say it is to be expected that if we climb a hill we shall pant a little. We carry a little more weight, and our heart muscle is not quite as good as it was. Perhaps we are a little too ready to accept what is common for the inevitable. The heart suffers enormously in any infectious disease—particularly in some, like rheumatism, diphtheria, and scarlet fever. But the heart muscle also suffers damage from slow infections that go on over a long period of time. So, as people get older, they sometimes allow the heart muscle to be damaged by infections they ought to look after. An important but not invariable source of such infection is the mouth. Dr. Babcock of Chicago, has emphasized the importance of the relation of chronic gall-bladder disease to disease of the muscle of the heart. He is perfectly right. I do not wish it thought that the mouth is the only place to be considered when we have disease of the heart muscle, or any others of the conditions I have named. There are other places to be thought of, although not quite so much as the mouth and teeth.

Since I have turned farmer and have watched plants grow and trees die, I have been impressed with the explanation of why the mouth and teeth are so frequently the sources of infection. When you study the process of the death of trees attentively, you see that

the fork of the tree, where the water rests after a storm, is the place that is first attacked by tree rot. In the same way, it is the unclean cavity of the mouth that gives the best opportunity for infection to enter the human body. It is for this reason that the mouth is so important, but it is not the only place through which infection can gain access.

V. RECURRENT ENDOCARDITIS.

Last of all, there is the question of recurrent endocarditis. I have told you about the young woman who had been foolishly advised to have all her teeth taken out, because of the danger of re-infecting the heart. That was foolish advice, but it is important to realize that anyone who has a damaged spot, a "place of lessened resistance," has to take more care to avoid exposure to subsequent infection than does one who is in good health. People with valvular disease of the heart are always liable to reinfection of the damaged valve, and they should exercise the greatest care about the mouth, the pharynx, teeth, etc. When anyone with a bad heart consults me, I look at the teeth with the greatest solicitude, and urge that the patient look after the state of the mouth. If infection gets in there, especially if *streptococcus viridans*, whose frequent habitat is in the mouth, gains access it is prone to reinfect an already damaged heart.

ON ROOT ABSCESES.

Now I want to say a word or two on this topic: Does every root abscess necessarily imply generalized infection? This is an important question for your profession to answer, and I think that you should approach it with an open mind. The fact that a person has a root abscess does not necessarily imply that everything in the way of disease he has is due to this root abscess. A man may have an arthritis that is due to gout and also have an abscessed root; or a man with a root abscess may have an arthritis due to infection from some other part.

We hear a great deal of talk about the new manipulations that you have performed in the way of root amputations. I am not in a position to express an opinion concerning this procedure of root amputation; but if that is not a feasible operation, it is time to get busy on one that is. I do not think that we are going to suffer your profession to sacrifice teeth as largely as they have been sacrificed in the immediate past. It behooves you to discriminate between an abscess that is infecting the system and one that is not. One that is not, can, perhaps, be drained and treated, and should be; for a tooth is a precious thing in my judgment, and I would not sacrifice one under any consideration if I thought there was any way of saving it.

THE QUESTION OF DIAGNOSIS.

The next question is that of practical diagnosis. I hold this point of view: I do not think a dentist alone has any business to diagnose such cases, nor is it a question for the medical man alone. When patients with suspicious oral conditions come to me, I say, "I want you to consult your dentist," because I think it is a question for consideration from two points of view. When you remove a tooth, you have done a damage that you cannot repair. There are two different points of view—that of the medical man and that of the dentist; there should be a consultation between them, just as in certain operations, such as appendicitis, a surgeon and a medical man should consult. I hate to hear of a tooth being taken out, on the advice of either the dentist or the doctor, without a consideration of the point of view of the other.

The next question is: In the diagnosis, what are we going to rely on? There are some dentists, and more doctors, who think the superficial appearance of the gum and the teeth justifies them in thinking there is no trouble at the root; but there are gums that look so healthy one would not suspect the serious trouble that exists underneath. I do not think this occurs often, but it does sometimes.

The next question is that of the X-ray. We are apt to think lightly of our own opinion and very highly of the opinion of the man who works in a laboratory and sends us his report. In medicine it works out in this way: A physician gets a report from the board of health that the blood test shows evidence of typhoid. He immediately throws over his own conception of the case and makes a diagnosis of typhoid, because the laboratory workers say they got a positive reaction. If you know that a man has broken his leg and they say that he has typhoid, do not give up your own judgment that the patient has a broken leg. This sounds ridiculous; but I have seen in practice cases almost as ridiculous as that.

Many dental practitioners are taking their own X-rays. They are apt to accept as final and authoritative the X-ray finding. The X-ray plate is like a photographic plate; it can lie outrageously, if the picture happens to be taken in certain directions. I recently examined the plates of two of the best X-ray operators in Philadelphia, and both had absolutely overlooked a very evident dental condition, which was afterward recognized in a third study and corrected. I have seen an instance in which a bad place in the plate was thought to indicate a bad abscess that did not exist. We must be more skeptical concerning the work of the X-ray artist; we should be less complacent, and not accept it lightly when there is a tooth to be sacrificed.

In addition to being sure you have an X-ray study that you can rely on, there are general conditions of the patient's health to be considered. If the patient has abscessed teeth, he is likely to have

some general indications or symptoms, provided the local disease has caused general infection. Unless we find these symptoms we ought, again, to be skeptical. The question comes down to this: Here is a plate that suggests a shadow around the root of a tooth. Are we to think an unexplained trouble, perhaps a very improbable one from the point of view of infection, is due to that? There is no kind of thing that men are not attributing to root abscesses. A patient develops iritis, glaucoma, or panophthalmitis. These are all manifestations that may mean gout, arterio-sclerosis, or syphilis; and yet someone is willing to say the condition is due to a root shadow, and he takes the tooth out. Teeth should not be sacrificed in this haphazard way; and, worst of all, the obsession that oral infections explain everything should not lead us to overlook much more serious conditions.

A FEW WORDS ON THE TREATMENT OF ROOT ABSCESSES.

Now I am going to say a very few words regarding the question of treatment. I have already expressed my opinion that the dental profession ought to be earnestly studying how they can introduce a conservative radical operation for such cases. I believe a root abscess wants drainage and cure. It cannot be dealt with tentatively. The long-continued treatment of root-canals seems very disappointing, but the extraction of the tooth is too radical a proceeding to be admitted as the last word on the subject. I hope root amputations are going to cure many cases by what I have chosen to call a conservative radical method.

A good deal has been said about the use of sera and vaccines. In the treatment of dental conditions they may sometimes be in place. In the case of the conditions that affect the soft parts around the teeth they may be useful, but I venture to predict that in the end result of their use in the treatment of root abscesses will prove wholly unsuccessful. You might just as well treat an abscess embedded in a bone elsewhere in the body by this means as to treat root abscesses with vaccines. You may treat gingivitis of various forms, and even pyorrhea, in this manner, and get results; but in root abscesses you deceive yourself in thinking you will get any result from that sort of treatment.

Finally, I wish to say that I am by no means a hopeless conservative so far as new points of view are concerned, and do not intend to convey the impression that I feel in opposition to the belief that unrelieved infections about the teeth may be a frequent source of widespread systematic disorder; but I wish to express as strongly as possible my opposition to unconsidered radicalism parading under the name of progressive treatment. When I see a culprit tooth that I think has been tried before a decent court, and without a packed jury, I believe in condemning it—and perhaps a whole set of teeth; but I dislike to see teeth sacrificed unless the condition has been openly canvassed and properly considered—*Dental Cosmos*.

Dentistry as National Defence

THE report of the Royal Commission, appointed by the Lord President of the Council in Great Britain, to investigate the extent and gravity of the evils connected with the practice of Dentistry by persons not qualified under the Dentists' Act, has been presented to Parliament and forms a most interesting and comprehensive document.

The Committee's investigations were most thorough, embracing the subjects of the shortage of qualified dental practitioners and the marked increase of unregistered practitioners; dental practice by incorporated companies; the evils arising from dental practice by unregistered practitioners; dental disease in relation to the health of the people; state dental service, including school dental inspection and treatment; education and training of dental practitioners and the ethical standard for dentists; dental fees; dental research; aid to dental schools; and the education of the public in the need for dental treatment.

The report has been called by some "The Dental Magna Charta," and is recognized by all as the dawning of a new day for Dentistry within the British Isles.

The following is a summary of the principal recommendations:

1. We are agreed that very grave evils are associated with the practice of dentistry and dental surgery by persons not qualified under the Dentists' Act. These evils are largely responsible for:

- (a) Lowering the social status and public esteem of the dental profession.
- (b) A great shortage of registered dentists owing to the unattractiveness of the profession.
- (c) Inability by the general public to distinguish between a registered and unregistered practitioner.
- (d) The dental treatment of the public being largely in the hands of uneducated, untrained and unskilled persons.
- (e) Grave personal injury owing to lack of skill and of technical knowledge.
- (f) Extractions of sound and only slightly decayed teeth.
- (g) Application of artificial teeth over decayed stumps and into septic mouths.
- (h) The existence in the public mind of the belief that there is no advantage in preserving the natural teeth, and that the correct thing is to let these decay and when trouble arises have all the teeth out and substitute a plate of false ones.

2. We are agreed that there was a great shortage of registered dentists before the war which has been intensified since. This shortage is mainly responsible for the following results:

- (i) Registered practitioners are very unevenly distributed in the different countries of the United Kingdom, and also in the different parts of each country.
 - (ii) The Registered Practitioner mainly attends to the dental needs of the upper and middle classes, the artisan and working classes in the bulk receiving very little treatment from the registered dentist.
 - (iii) The dental needs of the population do not determine where the registered dentist practises.
 - (iv) The registered dentist tends to gravitate to the centres of populous towns and to smaller towns, where high fees are obtainable or lucrative practice probable.
3. The causes of the shortage of Registered Dentists are mainly three:
- (i) The present unsatisfactory state of the law in allowing the practice of dentistry by unregistered persons who have not qualified for the profession by a prescribed course of instruction, training and examination.
 - (ii) The present length of the minimum course of instruction and training for dental students.
 - (iii) The present expense of training at a dental school.
4. With a view to providing a sufficient supply of dentists and meeting the needs of the public arising from the shortage of dentists we recommend as means which are essential for meeting present evils:
- (i) An alteration of the law so as to secure the prohibition of the practice of dentistry by persons not registered.
 - (ii) The registration under certain conditions of unregistered practitioners practising dentistry at the date of our report.
 - (iii) A reduction in the minimum time required to be spent by dental students to acquire a qualification in dental surgery.
 - (iv) The provision of dental treatment for expectant mothers and children under the age of 5 years.
 - (v) The completion as rapidly as practicable of an adequate system of school dental treatment.
 - (vi) The establishment of a public dental service.
 - (vii) The employment of dental dressers or assistants acting under the supervision of registered dentists in school and public dental services.
 - (viii) The establishment of a system of scholarships for dental students with adequate maintenance grants.
 - (ix) The registration after a short course of study and examination of dental mechanics employed as such during 5 years before the date of our report.
 - (x) Scholarships for dental mechanics.
 - (xi) Increased grants to dental schools.

5. We recommend that a special committee shall be appointed to admit unregistered practitioners, in practice at the date of our report, to registration as dentists subject to certain conditions being fulfilled.

6. A thorough research investigation into the causes and effect on health of dental caries is needed.

7. A Statutory Dental Board under the General Medical Council should be set up for the government of the dental profession. The Board shall consist of persons, including laymen, appointed by His Majesty in Council, dentists elected by the Dental Profession, and representatives of the General Medical Council.

CONCLUSION.

In conclusion, we wish to state very strongly that, in our opinion, the State cannot afford to allow the health of the workers of the nation to be continuously undermined by dental neglect. Steps should be taken without delay to recognize dentistry as one of the chief, if not the chief, means for preventing ill-health, and every possible means should be employed for enlightening the public as to the need for conservative treatment of diseased teeth. The dental profession should be regarded as one of the outposts of preventive medicine, and as such encouraged and assisted by the State. Treatment should be rendered available for all needing it. The present anomalous position in which an uneducated, untrained person can practise as a dentist, performing surgical operations on the teeth and jaws, doing untold damage and casting undeserved odium and dishonour on a scientific profession is intolerable, and should be dealt with immediately.

The report is important to Dentistry throughout the world. inasmuch as it recognizes dental service as an essential part of the great public health movement and foreshadows the scientific education of a sufficient number of dental students, through Government assistance to dental schools, to adequately meet the increasing public demand for dental service.

Dental standards and dental education of necessity must travel hand in hand. Serious difficulty always arises where there is lack of co-operation between teaching and licensing bodies. As a profession we must maintain dental standards. We must also adequately meet the public demand for dental services by training a sufficient number of undergraduates. The report will be of great value in further establishing dental service as an essential health branch and will doubtless lead to dental boards regarding their work as an important trust,—a public trust to be administered, primarily, in the public interest.

* * *

Until the war compelled widespread examination of the teeth, no nation appreciated the extent and seriousness of the situation. The Britisher is sometimes spoken of as "slow" but in this case he has evi-

denced a speed that may well be emulated in other lands. Just as soon as the mouth menace became known, a Royal Commission was appointed to deal with the matter. Britain is approaching the dental problem from the standpoint of national defence.

Sturdy Shibboleths

THE closely-printed periodical calling itself *National Health*—a journal of State, Municipal and Voluntary Health Ministration—exhibits now and again a sign of having its eye on the welfare of the nation's teeth. Not long ago it commended a Child Welfare Centre for presenting each child with a tooth-brush on attaining the age of three, and recommended the notion to its readers with an amendment to the effect that the presentation of the tooth-brush should coincide not with the third year but with the third tooth. The tooth-brush is very sure to be needed by the proteges of *National Health* if many of them are consuming the dishes which appear on a sample menu printed on the very page that contains the valuable dental hint. There are menus for dinners for six days of the week. The first courses are the usual (British) damp mass of meat or savoury and vegetables to be eaten together and here are the six ensuing puddings, in order:—flaked maize pudding and stewed plums; boiled rice and custard; semolina pudding; steamed gingerbread pudding or oatmeal cake; Quaker Oats pudding, with syrup; boiled rice and fruit. These meals are supplied at the centres run by the Women's League of Service for Motherhood, to expectant and nursing mothers at a charge of twopence each and have been worked out "with particular attention to the question of food values." While fully recognizing the beneficence of the work of the Women's League and the superiority of the food supplied to that of the average present-day poorer working-class household, one must deplore the loss of an opportunity of exercising a dietetic enlightenment based upon something more than the grouping of calories. Having said this much one is moved to ponder hopefully upon the "oatmeal cake" . . . and to wonder whether or no it is an attempt to rescue the warriors who are always with us from going down to face the life risk "fortified" by damp stodgy masses of "foodstuffs"? We note that the oatcake has an air of not daring to appear boldly in its own right as do the puddings. It comes in as a second string. It is firmly and perhaps rather unfortunately linked to the most fascinating pudding of the week. On semolina day it would, we feel sure, stand a better chance of demonstrating that even massed "meat and vegetables" can be faced without too much of the after-dinner feeling, if followed by something dry and crisp.

We gather that on the whole *National Health* deprecates the use of proprietary foods. In an article dealing with the evils wrought by the circulation of faulty and ill-considered diet tables, it enumerates as one of the worst of these evils, the recourse to proprietary foods. Perhaps it is because it considers that the bolstering up of an insufficient dietary by a "food" is better than going ill-nourished that it allows certain of these hypnotic compounds to appear in its advertisement columns. In a magazine that is evidently widely read by mothers and those interested in the welfare of mothers and children, it is sad to see the theory of milk for mothers—and grown children—not merely flourishing unconsidered and unchallenged in all its unconscious stupidity and cruelty, but actually insisted upon again and again. The ancients had their superstitions, but they did not feed expectant mothers on milk. They gave them the freedom of the orchards.—*The Dental Record*.

Preparation of the Mouth in Cases of General Anaesthesia

IT is quite plain that if the subject's mouth be not in a satisfactory state of cleanliness, it is necessary to set about making it so without a moment's delay, and in such case only the specialist is in a position to fulfil the requirements viz:

- (a) Removal of tartar.
- (b) Extraction of all infected or loose roots, verification of any pivoted teeth, crowns and fixed dental apparatus.
- (c) Grind down and obturate any crown that might scratch the tongue or get broken when the gag is applied.
- (d) Clean all alveoli and get rid of any pus therein contained.
- (e) Remove all movable dental apparatus before resorting to anaesthesia;

In short get rid of all septic and movable things in the mouth that might fall into the pharynx and be swallowed or breathed into the bronchi while under anaesthesia.

It is obvious that pus of buccal origin swallowed by an operated subject who is the victim of well-marked post-operative shock may give rise to septic complications possibly of a grave kind. Many pulmonary accidents following general anaesthesia may conceivably be due simply to the entrance of pus, tartar and other septic elements of buccal origin into the air passages.

PIERRE ROBIN, D.D.S.

The man who puts his pleasure before his business usually has a balky tandem to drive.

Home and School

*Devoted to the interests of Dental Health in
the Homes and Schools of the Community*

This Department is Edited by

F. J. CONBOY, D.D.S., Toronto

Provincial Dental Officer, Department of Education, Ontario

THE great need of the day in the training of our boys and girls, is to establish a closer and more harmonious relationship between the school and the home. Without the most intimate and sympathetic co-operation of the home, the school cannot possibly perform its function in the development of our boys and girls that they may become happy and successful citizens. Many of our leading educationalists have recognized this fact and as the result, we have in many communities well organized and efficient associations known as "Home and School Clubs." The object of the clubs is to promote a better understanding and closer co-operation between parents and teachers.

The need for this concurrent effort is just as urgent in health matters as in any other branch of education. Medical and dental inspection will do much for the school child of today, but the best results can never be accomplished until we are able to influence home conditions and get in touch with the children of pre-school age. This is especially true in connection with school dental service, as many destructive habits are formed and many of the deciduous teeth decayed before the children start to attend school. Realizing the need for this closer relationship the editor of ORAL HEALTH has requested the writer to conduct a department to be devoted to Dental Health in the school and home. In this section we will discuss school dental inspection and treatment and dental education and oral hygiene in the home. In our new Provincial undertaking we ask for the assistance and help of every member of the profession. If you are engaged in school dentistry let us know of your work. If you have given an address to any public body or have been able in any way to promote the cause of oral hygiene or dental inspection tell us of your success. By the publication of such facts other members of the profession will be encouraged to undertake similar work for the welfare of their fellows.

MORE than two hundred dentists who practice in parts of the Province of Ontario where there is no organized dental service, have written to the supervisor of dental inspection, signifying their willingness to assist in making a dental survey of the province. The letters received have been most sympathetic and encouraging and demonstrate that the members of the dental profession are quite willing to make a personal sacrifice in order to impress upon the public the urgent need for the immediate establishment of a system of dental inspection. There are some other men who are willing to assist but for various reasons they have not as yet written the department; it would greatly assist those who are arranging the details in connection with the survey if these men would kindly let the department know, at their earliest convenience, if they are willing to help.

* * *

DISTRICT REPORTS.

HAMILTON.—The dentists of Hamilton very kindly consented to make a dental survey of all the school children of the city but as the management committee of the Board of Education passed a resolution providing for such an inspection the gratuitous services of the members of the profession will not be needed. The Department of Education is most grateful to the Hamilton dentists for their very kind offer to assist in this work.

FORT WILLIAM.—The Board of Education has placed in the estimates the sum of Two Thousand Dollars for the establishment of a permanent system of dental inspection and treatment. This amount is provided for the balance of this year and plans are being made and sufficiently large estimates will be submitted to develop the work during 1920.

WINDSOR.—A dentist has been appointed to give free dental service for the school children of Windsor and Walkerville.

BRANTFORD.—This city has a permanent dental inspection and the work shows great promise.

WATFORD.—Dr. George N. Howden has been appointed to examine the teeth of the school children in the town of Watford. The inspection will take place in the fall.

MORRISBURG.—Dr. Will C. Davy and Dr. Geo. Gorrell have completed a dental inspection of the school children in Morrisburg.

BRAMPTON.—Dr. J. L. Mackle of Brampton conducted a dental clinic at Malton on July 8th and 9th. Forty-five children were examined and in some cases the necessary operations were performed.

BROKEN NERVE BROACHES.—Nerve broaches broken off in a root canal can be easily removed after a dressing of 25 per cent. pyrozone applied on cotton wool has been left in the canal for a few days.

Impression Filler, Surfacer and Separator

RUPERT E. HALL, D.D.S., CHICAGO, ILL.

PERSISTENT experimentation in the search for a better impression varnish and separating medium resulted in the discovery that the dipping of the impression in collodion produces, we believe, the most perfect and beautifully surfaced impression yet known.

To treat the impression in this manner, secure, as a minimum amount, one pint of flexible collodion (Squibb), and add a little shaving of the lead of an indelible pencil for coloring. Allow the impression to dry for about ten minutes or until the free water has passed away from its surface. Place in the plaster bowl sufficient collodion to permit complete submergence of the impression in it. Dip it into the solution, keeping impression side up. Remove from the solution and stand edgewise to permit excess collodion to drain. In two or three minutes the collodion will dry and the impression be ready for a second dipping. The first coating fills the impression and makes it impervious to the action of the second. The second acts as a varnish over the first, producing a surface as smooth as that of congealed collodion and approaching that of glass.

The solvent of the collodion, the ether, will attack the impression-tray compound material, so it is desirable to remove the impression from the solution as quickly as its surface has received a coating of the solution.

When finished with the solution, pour it back into the bottle, and cork tightly. As the ether, the vehicle of the solution, is highly volatile, it will gradually evaporate as the solution is used, and the solution will become thickened. When too thick add ether, and thin to the desired consistence.

Cleanse the plaster bowl, after using, before the collodion solidifies; otherwise it will form a hard crust that will destroy the flexibility of the bowl, and when the bowl is forced to bend, the rubber will crack, owing to the adhering unyielding coating of collodion.

Never attempt to paint collodion on the impression with a brush. The ether evaporates so rapidly that it is impossible to apply it uniformly, and it will lap and bridge over the undulations and irregularities of the impression.

Prior to pouring the cast, soak the impression in water to prevent any part of it from absorbing the water from the cast material. Next paint the surface of the impression with soapsuds and rinse off all free soap. The soap will effect easy separation of the impression from the cast. This step is essential, otherwise there is an adhesive tendency between the impression and cast. But be sure to free the surface of the impression of all excess soap by placing the impression

under running water, or submerge it in water. Excess soap will produce a defective surface in the cast; the surface will be porous and the quality of the material will be poor. Its action is derogatory to the quality of all cast materials.

The writer's success with the use of collodion, after the manner described, has been so highly satisfactory that he takes pleasure in recommending it as, in his opinion, the one best impression filler and varnisher yet devised. It by far surpasses any other medium and technique with which the writer is familiar, and is a source of satisfaction in his work in daily practice. It gives the finish to a plaster impression, and in turn delivers a smooth, dense cast.—*Dental Cosmos*.

Case Report of Necrosis of Mandible

PPRIVATE M——. On 17-3-19 patient had the second right lower molar filled. Two weeks later the first right lower molar developed pulpitis and this tooth was extracted, using regional anaesthesia. On 2-4-19 the region of the right mandible was much swollen and painful.

Complaint on admittance to Queen's Hospital, Sidcup, six weeks later:—

I.—Rough, bare bone in lower right jaw.

II.—Foul odor and taste in the mouth.

III.—Loss of weight and appetite.

PRESENT HISTORY.

Patient has lost weight and appetite is poor, as he has been swallowing pus and his breath is foul.

EXAMINATION.

The bone of mandible, right, from symphysis to angle is exposed, all the sockets of the recently extracted teeth projecting above the gum tissue, and pus oozing from the edges of the bare bone, which is free of gum tissue to a depth of nearly an inch. The entire half of the mandible is loose and can be raised with slight pressure.

PAST HISTORY.

On 17-3-19 had a tooth filled and later another molar had to be extracted, using local anaesthesia injecting the same into the region of the swelling. On the 2-4-19 he was admitted to hospital in England because of the swelling and the pain in the region of the right mandible. In consultation with Dental Officer at that hospital it was decided to remove two teeth from this region, the two remaining molars. On 4-4-19 the patient's condition was worse, high temperature, rapid pulse, and profuse perspiration, so further consultation requested with Dental Officer. It was decided to remove the remaining teeth in the lower right mandible and as the oedema in the region of the mandible had extended, that a drainage tube be placed in the neck at once.

OPERATION.

All the teeth removed from the right side, extensive necrosis of the horizontal ramus found, and the bone denuded from the right angle to the chin.

NOTE.—(by medical officer at previous hospital).—This man's treatment is likely to extend over a considerable period; nothing can be done further at present, beyond keeping the parts clean until he gets some periosteal regeneration and separation of the sequestrum. This will be a matter of some months and advise transfer to a Canadian Hospital. Admitted to Canadian section of Queen's Hospital, Sidcup, six week later, see "Present History" above.

17-5-19—Wasserman done—report negative.

DIAGNOSIS.

I.—Syphilis—ruled out as no history of any infection, and Wasserman negative.

II.—Carcinoma—progress rather rapid, infiltration of tissue due to fluid in tissue—and further ruled out by history.

III.—Osteomyelitis (subacute) at this date. History dating from injury, pain, temperature and pulse pointing to bone infection, also tendency to sequestration.

TREATMENT.

Under general anaesthesia, the sequestrum was removed by the fingers and area rubbed with gauze to remove the loose pieces but not endangering the periosteum if by chance any remained. A flange with inclined plane was constructed by Capt. Campbell, C.A.D.C., to maintain the teeth of the opposite side in the correct occlusion.

PROGNOSIS.

It will be some months before anything further can be attempted except mouth irrigations and then a bone-graft will be necessary. The proper space and occlusion of the teeth is maintained by the excellent flange constructed by our Dental Colleague, Capt. Lewis Campbell, C.A.D.C.

Case reported by Capt. Lewis Campbell, C.A.D.C., and E. F. Risdon, C.A.M.C., care Canadian Section, Queen's Hospital, Sidcup, England.

“A Dental Office in Every School”

DR. Royal S. Copeland, Commissioner of Health, City of New York, in answer to an enquiry in reference to the action of the civic authorities on the dental clinic ordinance, recently passed by the Board of Aldermen, said: “I hope to see the dental problem more energetically met by the city of New York and look forward to the time when there will be a dental office in every school in New York.”

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

METHOD OF FIRM ATTACHMENT OF VULCANITE TO ALUMINIUM DENTURES.—An aluminium plate with teeth attached by vulcanite forms a very light denture, comfortable to wear, and of little bulk. It is well known, however, that after being for some time in use the vulcanite is liable to separate from the aluminium, as the result of some chemical or electro-chemical action. A method of obviating a breakdown from this particular cause would probably lead many practitioners who have abandoned the combination to try it afresh. When the case is ready for rubber packing, the cleaned aluminium surface is coated with a thin solution of rubber in chloroform, and over this, when dry, is carefully packed a layer of weighted rubber, and the further filling of the mould space is completed with ordinary rubber. Those who have tried this method claim that the attachment between vulcanite and aluminium remains sound, and a stable union between the two is secured. A similar use of weighted rubber—of the metallic filling kind—was some years ago found very serviceable with the other metals in attaching teeth by vulcanite to “wire bar” lower cases; the resulting union was so very close and intimate that hardly anything short of filing or chiselling would effect their separation.—*Dental Record*.

WHAT IS NICKEL SILVER.—So-called German silver is a composition of nickel, copper, and zinc in varying proportions. Its value in the arts depends on its color, lustre, hardness, tenacity, toughness, malleability, ductility, machining qualities, and resistance to alkalis and acids. Generally speaking it is manufactured in three ways. The German method was to melt all the copper and two-thirds of the nickel and zinc in a graphite crucible; and then add the rest of the nickel and zinc. In the English method, all the copper, nickel and zinc are melted at one time, then zinc and copper are added, should a test show that the metal is porous; a fireclay pipe containing pitch is pushed into the metal to deoxidize it. One American method is to melt a copper-nickel alloy and then gradually add the preheated zinc.

“German silver” is now called nickel silver.—*The Crucible*.

Personal Sketches of Canadian Dentists Who Served in the War

THE part that Canadian Dentistry has played in the world war is, in the aggregate, the personal experiences and worthy efforts of Canadian Dentists who served in the Canadian Army Dental Corps or other branches of the service.

Dentistry would like to know who these men are, and we urge upon every member of the profession, who enlisted in the C.E.F., to send to Oral Health the following information, immediately upon discharge from service:

Name in full, with rank.....
 Place where engaged in civilian practice.....
 Date of graduation and name of college.....
 Married or single.....
 Date of enlistment.....
 Date of discharge.....
 Unit.....
 Character of service, and other information of interest.....

 Photograph.

Every man should consider it as a duty to his profession to assist, in so far as he is able, in completing the dental record of the war. We appreciate the feeling of reluctance which all the men possess, when asked to speak of the service they have rendered. However, this very commendable diffidence should not be permitted to interfere in any way with supplying the information requested, to the end that a fairly complete history may be secured of Canadian Dental practitioners who served in the war.

Oral Health plans to publish one or more of these "Personal Sketches" every month and we trust they may not only prove of great interest, but will be of inestimable value when Dentistry's part in the great war comes to be fully recorded.

—Editor.

* * * * *



CAPTAIN RICHARD J. GODFREY is a graduate of the Royal College of Dental Surgeons, and enlisted in the Canadian Army Dental Corps at Toronto, March 4th, 1916. He embarked for England, April 18th, 1916, and was on duty, while in England, at Shorncliffe Camp, with reserve battalions and Canadian Railway Troops, Purfleet, Essex. Embarked for France, Nov. 29th, 1917, for duty with No. 12 Canadian Field Ambulance, 4th Canadian Division. Served with Ambulance until his return to Canada, arriving at Halifax, June 8th, 1919.

Captain Godfrey has resumed civilian Dental practice at 326 Bloor Street West, Toronto.



Nursing A Sorrow

TO nurse a sorrow is to increase it, and make it real. Some people hug a sorrow to their heart, and coddle it and "roll it as a sweet morsel under the tongue." They seem to thrive on it, and even to make capital of it. They assume that it is their bounden duty to share it with their friends, and they are very liberal in their distribution of it. They carry gloom wherever they go, and leave depression in their wake. They accomplish nothing by their attitude except to make themselves and other people unhappy.

Supposing you lose a friend, a friend who is very dear to you. It wrings your heart to suffer the loss, and the world looks bleak, forlorn, and dreary. The crushing blow is almost more than you can bear, and you know that life will never be the same to you again. It is grief,—grief of the poignant kind that wrings the heart, and leaves you limp and listless. You are bowed down by your sorrow, and you care little for life. There is a breaking of the bonds that held you to the affairs of earth, and you find yourself drifting despairingly, you know not whither. You are surprised that the world does not seem to realize your loss, that people go on about the routine of life as they did before. To you at that moment the world seems thoughtless, heartless—almost cruel. You wonder why people can be happy when there is so much sorrow, when so many hearts are heavy. You hear laughter and it sounds like hollow mockery, you listen to music and unless it is sad it is out of tune.

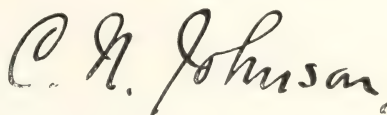
But be assured of this—your point of view is wrong. You have been driven out of your normal reckoning by your bereavement, and you are no longer balanced. You have for the moment lost your perspective, and cannot see correctly. The world is not cruel, nor are the tunes out of harmony. It is your hypersensitiveness and the obscuring of your vision that constitutes the incongruity. The scheme of nature was not that there should be sorrow—at least perpetual sorrow—and the world is merely trying to make you normal once more. If the world fell into your mood and all nature put on

black because you were bereaved what would be the result? Every man's sorrow would spread depression, and there would soon be no sunshine in life.

The world is not cruel—it is merely trying to help you—and sometimes the task is disheartening. It all depends on you. If you cling to your sorrow you do not lessen your load, and you add immeasurably to the load of your friends. Shake off your sorrow as an abnormality, as something to be overcome. Remember that grief is non-constructive but always disintegrating. It rends the heart-strings out of tune and plants despair where hope had been.

If you must be sad hide it from the world, and let the sunshine in. To help yourself out of a sorrowful mood plunge into the activities of life, and begin to do good to your fellowman. Working for the happiness of others is the surest solace in time of trouble, and the surest way to happiness for yourself. To stoop down and lift a fallen comrade from the wayside makes your own heart lighter, and tends to the forgetfulness of your ills.

To nurse a sorrow is to make it grow, to overcome it and rise above it is to place yourself in harmony with the great fundamental principle of life, and make you master of your every mood. Think of others and you will forget yourself, which is, after all, the chief triumph in life.



One New Thing Each Day

LEARN one new thing each day. If this plan is adhered to for one year your brain will have received and recorded three hundred and sixty-five new impressions.

It probably will not be given to you to learn a big truth each day, but the average will be well worth your while.

This is a good habit to acquire, as it is one that will grow upon you, and you will learn to seek out the more important things.

Suppose you but open the dictionary and learn the meaning of one new word, you have added that much to your vocabulary, and to your understanding.

If you are passing a store window and see displayed some article with which you are unfamiliar, step into the store and ask what it is, and what it is for.

If someone with whom you are conversing makes use of an unusual word or phrase, note the meaning.

Learn one new thing each day.—*Personality.*

ORAL HEALTH

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No. 8

EDITORIAL

Re-establishment of the Returned Dentist

WHILE the soldier-Dentist who relinquished his practice and sacrificed much during the war, certainly does not return looking for favors, nevertheless it should be the desire of his confreres to give him every possible help in re-establishing himself in Dental practice.

During the war, civilian Dentists profited more or less through the absence of practitioners who had enlisted for service. It ought to be (and doubtless will be) a real pleasure for these practitioners to refer patients to returned men, and otherwise assist, as occasion presents, in re-establishing them in successful practice.

Oral Health proposes to publish, from month to month, personal sketches of returned Dentists. This will acquaint our readers with the names of these men, and thus enable them to assist in this patriotic endeavor.

The X-Ray an Essential

SCIENCE is ever harnessing the elements for man's advantage and well-being, until time and space have been almost entirely eliminated. Transports returning our soldiers to their homeland seem almost to bridge the ocean, stretching as they do from

shore to shore. Meanwhile, intrepid airmen have spurned the safer water route, and without stop have sped through space, from continent to continent, defying the elements in their hazardous flight. This scientific development is but a very small part of the advances that have occurred during the present generation.

Dentistry, too, has been moving apace. Applied Science has revolutionized the practice of Dentistry during the past decade. The X-Ray has become the eye of the modern Dentist. He is now able to see many things that were formerly as a closed book. The X-Ray is, in many cases, just as essential to the Dental operator as is the root-canal instrument.

Dental progress has been so rapid that there is grave danger of the too conservative members of the Profession living in the past. We are apt to unconsciously slip into a rut, and then wear it so deep that we cannot see over the top. An X-Ray machine will do more to pull a Dentist out of the rut and put him on high ground than any other single agency we can think of.

There are doubters abroad, and skeptics still abound, but after every phase of the X-Ray question has been discussed, and all the limitations and failures noted, the fact still remains that modern Dental service cannot be rendered without the aid of the X-Ray, and the Dentist who persistently ignores this fact is trying to lift himself by his boot-tops. It is impossible to disassociate the X-Ray from successful practice.

“Home and School” Department

IN a recent issue editorial reference was made to the organization of provincial school health inspection in Ontario, through the Department of Education, and of the appointment of Dr. Fred J. Conboy as Provincial Director of Dental Inspection. We drew attention to two things which each individual dentist in Ontario could do to assist this movement, namely, write to the Provincial Director of Dental Inspection, informing him of conditions in your municipality, and advising him in regard to the best method of establishing a system of school inspection for your particular community; and offer to give, free of charge, a small portion of your time to assist in making the initial survey. We are most happy to report that two hundred Ontario dentists have already volunteered for this service. This is a wonderful response and with the additional dentists who will doubtless send in their names, the success of this first province-wide dental survey of school children is certainly assured.

Readers of this magazine will be glad to learn that Dr. Conboy is to have charge of a new department in ORAL HEALTH to be known

as "Home and School," and to be specially devoted to the interests of dental health in the homes and schools of the community. Elsewhere in this issue will be found Dr. Conboy's initial contribution to this department. It is hoped that "Home and School" will become a clearing-house for ideas concerning all phases of public oral hygiene work and will prove of practical benefit to dentists who are called upon to make actual school inspections, or present papers or deliver addresses to teachers, mothers' meetings, or other public bodies.

"Home and School" will not be confined to reports of work in any one section or country. Dr. Conboy hopes to receive reports and suggestions from every community. Will the reader please accept this invitation to send a detailed report to Dr. Conboy covering the oral hygiene work in the reader's district? The only way for *one* to learn of the work of *another* is that *both* "report progress." If you have nothing to report, write to Dr. Conboy and ask for a solution of your difficulty. You may have been invited to address the members of your home club upon the subject of oral hygiene. Send a synopsis of your address and ask for suggestions.

Pathological Laboratory and Dental Museum

DR. C. A. KENNEDY, Curator of the Museum, Royal College of Dental Surgeons, has requested *Oral Health* to invite the members of the Profession to forward to the Museum, at the expense of the College, any interesting specimens of natural teeth, dental appliances, prosthetic pieces, or old-style Dental instruments. Dr. Kennedy would also appreciate receiving pathological specimens for the Museum. After the removal of the tissue, it should be forwarded in a jar containing 10 per cent solution of formalin.

Professor Graham, of the Pathological Department at the College, would be glad to answer any questions, look up the literature, or give a brief summary of any pathological cases referred to his Department by members of the Profession. The R.C.D.S. Pathological Laboratory is at the service of the Dental Profession. The average practitioner comes in contact with many cases that require the help of the Pathologist, in the diagnosis of tumors, syphilitic lesions, carcinoma, etc. It would also be mutually helpful if practitioners would place extirpated pulps in 10 per cent formalin solution and forward the same, with a short history of the symptoms noted, when microscopic examination and report might be made.

It is certainly important that the Dental clinician and laboratory expert get together more frequently and co-operate to their mutual advantage and the great benefit of the public.

The Reign of Beauty

“THE dental profession has established and prolonged the reign of beauty. It has added to the charm of social intercourse. It has lent perfection to the strains of eloquence, and has taken from old age its most unwelcome feature.”

—*Oliver Wendell Holmes.*



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ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, SEPTEMBER, 1919

No. 9

Anesthetics in Dentistry*

Special Consideration of Nitrous Oxide and Oxygen; Its Characteristics as an Anesthetic; Its Indications and Contra-Indications in Dental Practice.

BY J. P. HENAHAN, D.D.S., CLEVELAND, OHIO.

IT is gratifying to see the enthusiasm with which the dentists of the United States have taken up the practice of Nerve Blocking Anesthesia.

A few years ago it would have been an easy matter to make a census of all the dentists who were producing anesthesia in this manner. Many dentists who, comparatively a short time ago, began this practice, have in their enthusiasm turned teachers and are spreading the doctrine until now there are few entirely unfamiliar with the practice.

However, the element of human nature is asserting itself now in the form of prejudice, which unfortunately takes the form of opposition to all other forms of anesthesia. This unfortunate condition should not be allowed to develop, because prejudice is blind and usually expressed in the form of antagonism. Opposition of this kind is not logical because it must be realized that none of the present anesthetic agents or methods can be eliminated; they are all necessary.

It is not the enthusiast in Nerve Blocking Anesthesia alone in whom we note this mental state, we see it also in the man who has had many years of success with older methods of anesthesia, and who stands pat, determined that as far as he is concerned there is

(*Read before the National Dental Association, Chicago, August 5-9, 1918.)

no need for further improvement. These are not the men to whom I wish to speak, because it would be a waste of time to attempt to convince a man against his will.

The medical and dental professions are very keen to reap the benefits to be derived through the use of anesthetics, and great strides are being recorded in various directions for the relief of pain and suffering.

Anesthesia, although well developed to-day, may be considered as only in its beginning. It is gathering force which will be so great that no such friction as the opposition of any one man, or group of men, can impede its progress.

In medicine the need for anesthetic aid in certain classes of cases was recognized, and in consequence we have recently heard much of Twilight Sleep, Anoci-Association, etc., etc., and they have filled a need which the world has always felt, but has had to get along without.

Dentistry also has wanted for anesthetic aid in certain directions, especially operative dentistry, and conductive anesthesia apparently goes a long way to fill the need.

Chapters have been written recording the action of Cocaine, Chloroform and the other anesthetic agents, general and local, and the many tragedies which have attended their early use. The results of observation and research are now at hand and our knowledge, enriched thereby, warns us of the peculiar danger attending their use.

While we as a profession may be proud of our progress in anesthetics, there still remains much work to be done. Our first duty to the community is the routing out of the laggard and forcing him, by the light of popular opinion, to bring himself up to date. There are plenty of men still who do not attempt to employ any form of anesthesia, and still others who attempt to practice anesthesia according to the ideas of thirty years ago; their methods in local or general anesthesia are obsolete. There are those who inject a decoction of something or other containing any percentage, known or unknown, of Cocaine anywhere into tissue of any kind and condition. There are those also who administer Nitrous Oxide by itself and who expect thirty seconds of available anesthesia to suffice for the completion of any operation. These are the men whom the Profession must interest itself in, for they are the only ones who are left, and we must enlighten them if not entirely for their own sakes, for the sake of the public and the name of our profession.

In considering methods for the elimination of pain in dentistry we must also consider the nature of the pain or suffering which we must eliminate, and then apply the method of anesthesia which is indicated.

Pain in dentistry may range from that caused by the application of the rubber-dam and ligature, to the removal of a vital pulp or the pain produced through extraction of a tooth or some oral surgical operation.

The pain following the operation also must be considered and must be treated accordingly as it is of traumatic or bacterial origin.

The selection of the remedy must involve a consideration of many substances and classes of drugs. In this must be included the consideration of dosage, the duration of anesthetic and the method of application.

Much criticism is directed toward Cocaine and indeed this drug always since discovery has been the subject of much discussion. We shall always be anxious to hear the views of those who have something new or interesting to tell. We are perfectly aware of the peculiarities and the dangers of Cocaine; knowledge which has been developed as the result of clinical as well as chemical research; but, in spite of all of this we must still consider Cocaine as a very valuable drug in dentistry and medicine, although its use in dentistry is now reduced to the minimum, it possesses virtues which we do not find in any other local anesthetic drug.

Cocaine is a protoplasmic poison and exerts its influence locally or generally. We cannot tell in advance anything about the patient who presents an idiosyncrasy for this drug. It has been shown that the safest way to administer Cocaine is in perfectly sterile saline solution, in very small percentage not greater than one-half of 1 per cent. This solution should be injected very slowly. It affords opportunity to notice development of the poisoning symptoms when we may desist in the introduction of the solution.

Simply to condemn Cocaine, however, because as an individual we have found a substitute which is satisfactory to us, is not a fair standpoint, and it is not adding anything to our fund of professional knowledge.

In like manner we may consider the criticisms which have been advanced regarding the use of Nitrous Oxide, and Nitrous Oxide and Oxygen. We read many references to-day objecting to the use of these gases for anesthesia and analgesia.

When considering the subject of anesthesia, with Nitrous Oxide and Oxygen, we must admit that to become proficient in the use of this agent much experience is a necessity, and experience must be accompanied by thorough study. Besides this the personal equation must be considered and we are aware of the fact that not everyone who attempts this form of general anesthesia becomes proficient or expert. It, therefore, behooves the critic to leaven his remarks with fairness. He should be cautious when he condemns

any agent which is in daily use in the hands of thousands of successful operators in the Country.

Besides the nature of the pain to be eliminated in dental operations, the type of patient to be operated upon is an important consideration for the thoroughly trained man. In nearly all cases where the patient is likely to suffer pain, it would seem that some anesthetic, whether or not it is the one indicated, might be regarded as better than none, but so far we have not found an anesthetic which may be regarded as universal.

One of the chief objects for which an anesthetic is employed is the prevention of shock. Shock we all know may be produced in some patients more readily by mental impressions than through physical irritation, consequently we must consider any anesthetic which does not overcome this possibility as wanting in this direction, no matter what its virtues may be in other regards.

As a result of research and observation carried on by Dr. Crile and his associates, he has made the following statement:

"Each anesthetic covers part of the field but there is no single agent that alone can produce Anoci-association, which is the goal of operative surgery. We, therefore, do not advocate Ether alone, nor Chloroform alone, nor Nitrous Oxide alone; we do not advocate local anesthesia alone nor morphine and scopolomin alone, nor spinal anesthesia alone, but thru selection and combination of anesthetics we aim to attain an anesthesia that will exclude all stimuli from the brain and thereby attain anoci-association."

These statements are like the hand-writing on the wall for the Dental Profession. We must be prepared to induce the anesthetic or combination of anesthetics indicated.

The advent of nerve blocking anesthesia has proved to the dental profession the fact that as a body we can carry on a study and achieve wonderful results.

One of the chief reasons for the widespread use of nerve blocking today is the fact that our dental organizations have *as organizations*, given countenance to it and the men who teach it, thereby instilling confidence in the rank and file.

If the study of nerve blocking has produced such wonderful results, then it also is desirable that study be pursued for the mastery of any subject which embodies equally great possibilities.

It would be proper for our district societies, or even the National Dental Association, thru committees, to procure the services of capable and well known men to be delegated to various sections and give post-graduate instructions in the administration of Nitrous Oxide and Oxygen, under the auspices of Local Dental organizations. Great good to the profession and community would result.

The administration of Nitrous Oxide and Oxygen never has been

thoroughly studied except by a limited number of the dental profession. It should be studied carefully under the tutelage of competent teachers. The man who makes a serious business of it and who studies and observes will gain success and all the benefits which may result from its successful use.

Local anesthesia, or any modification of it, cannot be regarded as entirely sufficient for the dental profession. There are many instances in which it is contraindicated, both on account of conditions in the operative field, and the type of patient. Young children, neurasthenics and hysterical types often are impossible of operation under local anesthesia because not even the anesthetic can be administered. The anemic and apprehensive patient with lowered vitality and resistance, even tho experiencing no actual pain, often suffers such mental strain as to produce collapse. The otherwise strong and healthy patient who has suffered much pain with loss of sleep, and possibly being in a state of general infection, is not to be regarded as the ideal patient to whom a form of local anesthesia should be administered for the performance of a severe or prolonged operation. A child six or seven years of age who has lost sleep and is fretful suffers much from mental strain while undergoing the difficult removal of a sixth year molar for instance, under local anesthesia, and even tho no actual pain is experienced, leaves the child as fearful of the dentist's chair as if no anesthetic at all were employed.

Pregnant women always should be the object of our greatest consideration. According to the individual we see this class of patients in the most extreme condition of nervousness, and shock must be avoided in all events. Here we find another contraindication for local anesthesia. We must not forget to consider the nursing mother whom we sometimes see in such a state of physical and nervous exhaustion that shock might easily be produced with the resulting suppression of the secretion of the mammary glands. In all such cases Nitrous Oxide and Oxygen is the anesthetic indicated.

The object of this paper is in no measure intended to retract from one, nor yet to make unreasonable claims for another form of anesthesia; it is simply intended at this time of enthusiasm in connection with something new, to again draw attention to that older form of anesthesia, which has been the standby of our predecessors and which today is more frequently used than ever before, Nitrous Oxide and Oxygen.

This agent has been demonstrated as being the safest of all anesthetics; it interferes less with and impairs less the natural immunity of the patient, than any other anesthetic.

The best students of surgery in the world will be sure to take greater advantage of its use as time goes on

Recently I have been informed that the British Army has offic-

ially prescribed Nitrous Oxide and Oxygen for use in its War Hospitals, being used to great advantage in dressings, some of which are almost equal to a major operation. The frequency with which it may be repeated, brief induction period, absence of after effects such as nausea, etc., are circumstances which influenced its adoption.

Again referring to the writings of Dr. Crile, we see that he believes shock results in many operations because the single form of anesthesia is not sufficient to protect the brain cells from exhaustion.

If local anesthesia alone is used, then even tho no real pain is endured, shock is produced by psychic disturbance, and if only general anesthesia, shock results because not only the part of the brain which is not anesthetized becomes exhausted but also the part which is anesthetized.

He recommends and practises a combination of local and general anesthesia, believing that general anesthesia protects the brain cells from exhaustion due to psychic influences and nerve blocking protects the brain cells by blocking the conductivity of the afferent nerve trunks, thereby eliminating all actual irritation from the brain.

If this is good and common practice in general surgery for the removal for instance of an appendix which requires only ten or fifteen minutes of the time of a skillful surgeon, why is it not good practice in dentistry for the removal of a difficult impacted tooth, an operation which often requires an hour and which sometimes is attended by serious shock?

The combination in this particular connection is also followed by very favorable results locally. The tissues are usually not so highly inflamed and if the postoperative treatment is somewhat of the same nature, the inconvenience and pain are reduced to the minimum. In other words, we keep the tissues in a state of physiological rest and the brain protected from exhausting irritation.

The objection that experience is necessary to the successful use of Nitrous Oxide and Oxygen is no objection at all. It may be a hindrance for the time being, but should not be considered by the man who really is sincere and whose determination to progress is sufficiently strong.

Conductive Anesthesia is a blessing to the man who employs Nitrous Oxide and Oxygen in that it permits him to eliminate what was a very undesirable feature of practice. It affords a satisfactory anesthetic for Alcoholics, Habitual Drug users, and other cases difficult to anesthetize, without trouble or danger. In this class of cases usually there is little to fear from psychic disturbances.

TECHNIC OF ADMINISTRATION OF NITROUS OXIDE AND OXYGEN TO THE AVERAGE PATIENT.

At the time when a patient is to be given an anesthetic in the

dentist's chair, it is supposed that as far as possible all preliminary arrangements have been made.

The patient has been fasting for three hours at least before the appointed hour.

If the patient is a woman she should be left for a short time to the attentions of the lady assistant who gives advice which precludes any embarrassing situation during anesthesia.

All tight collars, neck bands, or excessively tight body lacing should be removed.

It is to be supposed, whether evident or not, that the patient is in a state of high nervous tension.

The patient should be placed in a comfortable position in the chair.

The dentist by action and conversation applies suggestion calculated to quiet the fears of the patient, because as stated before, successful technic for the administration of Nitrous Oxide and Oxygen must comprise also to a great extent treatment of the mind.

The patient should be shown the easiest position in which to sit.

The feet should be extended, but not shoving against the foot rest.

The hands should be resting in the lap, not grasping the arms of the chair.

The neck should not be bent backward because this incites a desire to swallow constantly.

It should not be bent forward because especially after anesthesia develops it interferes with free respiration because the chin approaches or rests upon the chest, constricting the air passages in the throat.

The aim is to have the patient in a comfortable position and then have patient relax completely; pay some attention to this, for if the patient remains tense with muscles contracted, the tendency is to become more so, requiring a much deeper and prolonged anesthetic.

At the most favorable moment the patient is again reassured, in a very positive manner, that there is no danger and that no pain will be experienced.

Notice privately that your patient breathes comfortably through the nose with the lips closed, for many patients believe without cause that they cannot breathe through the nose.

You have determined beforehand what work is to be performed and then you carefully select a mouth prop which will hold the mouth open sufficiently to permit operation but not to such an uncomfortable extent that it causes swallowing or interference with respiration. Some types present in whom the lower jaw is short due either to lack of development, or as the result of scalds or burns. In the latter case the cicatricial tissue binds the jaw and limits its action. In any of these cases there is a tendency toward automatic

closure of the air passages when an attempt is made to open the mouth to any great extent. Extreme care must be exercised and intermissions permitted to allow for correction of any respiratory interference after anesthesia is induced.

It will be noticed in many operations upon the lower jaw, that a tendency toward cyanosis will develop; this is not due, as a rule, to incorrect mixture of gas or oxygen, but to partial closure of air passage due to pressure necessary in operation. This condition is eliminated by frequent intermissions and drawing forward of the jaw.

When all preliminary details have been arranged, place a mouth prop of proper size in position and place mouth cover over the mouth and permit the patient to continue breathing as usual; inform him then that he is doing just what you want him to do, that he is breathing thru the nose.

If the patient shows fear or undue excitement at this stage and the manner of breathing is affected, being either too shallow or violent, say quietly that comfortably deep and regular breathing is what you desire; inform your patient not to talk or swallow. The object is to avoid a feeling of suffocation.

Now, examine your nasal inhaler and note that the expiratory and air valves are wide open. This is a very important detail; place your inhaler quietly and carefully on the patient's nose, and after allowing a few moments for patient to become accustomed to it, carefully and slowly turn in Nitrous Oxide gas.

It may be remembered that the patient will, on account of the open condition of the inhaler, be breathing with no more difficulty than before the inhaler was placed, and our object should be not to change conditions suddenly and perhaps cause panic or excitement by allowing gas to rush in suddenly.

As the gas flows into and partly fills the bag, the air valves (not respiratory valves) should be gradually closed. When this time arrives Nitrous Oxide has been substituted for Atmosphere and we must carefully observe our patient for signs which will indicate the necessity for Oxygen. It is not possible to give definite rules for this as conditions vary with all patients; however, the majority will be affected in more or less a common manner.

The average patient after inhaling about six full breaths of Nitrous Oxide, will show faint signs of approaching cyanosis and should be given Oxygen. About 8 p.c. on an average should be admitted at this time; as the anesthesia progresses more oxygen usually must be added. The Oxygen must be added according to the developing symptoms of the patient and not according to any set of rules, each patient being a problem in himself.

The anesthetist's ear should be trained to respiratory sounds and

it should be remembered that while the patient retains any control of respiration, anesthesia is not profound.

Under the foregoing conditions, about one minute is required to induce anesthesia, and the patient should present an appearance as if in a state of natural sleep.

The color of the skin should be practically the same as before anesthesia was induced.

Respiration should be profound and measured.

The pupil should not be dilated; (should not be more than two or three mm in circumference.)

The pulse should be full but not noticeably increased either in size or frequency.

MIXTURE OF GASSES.

If the mixture of gasses has not been correctly made the patient will present relative symptoms:

First, for want of sufficient Oxygen the patient presents symptoms of a straight Nitrous Oxide Anesthesia, and will become cyanotic due to partial asphyxia, or

Secondly, on account of too great a supply of Oxygen will be unduly stimulated.

In the latter case the patient's color is very red, especially the lips and the lobes of the ears.

The breathing is irregular with possible holding and muscular straining, and if not quickly corrected, the patient becomes excited and possibly troublesome.

If the mixture is correctly made, as evidenced by the fact that the color does not change in one way or the other, but still the patient is not sufficiently anesthetized, then we must modify the technic so as to cause the blood to take up more Nitrous Oxide. This is done by increasing the interpulmonary pressure, in the following way:

The respiratory valve on the inhaler, which up to this time has been working rather freely, is now partly closed, thus constricting the passage for escape of the expired gas, and automatically increasing the internal pressure in the gas system and the alveoli of the lungs, causing an increase in the amount of gas passing through membranes. The general mixture of Nitrous Oxide and Oxygen is not changed only as the progress of anesthesia indicates the necessity of an increase in the supply of Oxygen.

TECHNIC OF ADMINISTRATION OF NITROUS OXIDE AND OXYGEN TO CHILDREN.

In the case of a young child a great deal of judgment is necessary.

Dentists often are called upon by surgeons for aid in minor surgery cases such as adenectomy and circumcision. For children either of these operations are more serious than extraction cases, and may

through nervous reflexes, cause the development of respiratory troubles, and the younger the child the more likely are these symptoms to be seen. Deep surgical anesthesia must be maintained without interruption.

Children less than five years of age generally are not regarded as proper subjects for this anesthetic.

Children from five to fourteen years seem to present a different problem at all stages between these years.

The very young are difficult to control before anesthesia and those about twelve to fourteen very difficult after anesthesia is partly induced.

The youngster oftentimes will not submit quietly and therefore must be attended to in a special manner.

After all efforts to induce the child to submit quietly have failed, the Nitrous Oxide and Oxygen is allowed to commence flowing into the machine. The air valve on inhaler in this case is not opened.

The Oxygen is admitted in bountiful proportions from the beginning, and then the inhaler is placed over nose and mouth at once, and no matter whether the child inhales through the nose, or mouth, or cries out, the gas is admitted to the lungs.

Anesthesia develops quickly and then the child is placed in a correct anesthetic position and if the Oxygen supply is noticeably too great it is gradually reduced.

If the child voluntarily submits, then the technic is practically the same as for the adult. Young children, however, as a rule breathe more freely through their mouth after it is open, therefore, it is advisable to place the inhaler over the mouth until anesthesia is induced, at which time it may be placed over the nose. It is well also to admit Oxygen to the mixture plentifully and early, because often asphyxia develops so quickly and suddenly that symptoms are seen even before anesthesia, and are attended by violent muscular contractions of a general character.

Discernment is necessary at this stage for the reason that inexperience may misinterpret these muscular movements as voluntary; it would be a serious mistake to continue without Oxygen.

A liberal supply of Oxygen prolongs the induction period and prevents the development of the foregoing symptoms.

MOUTH BREATHING.

Much difficulty is encountered in certain cases either young or old, when the operative stage is reached, because the patient habitually breathes through the mouth and returns to consciousness. This is overcome in either of three ways after the mouth cover is removed:

First: by completely closing the expiratory valve or inhaler,

and, if necessary, increasing the volume and pressure of gas, thereby forcing down the soft palate, or,

Second: by manipulating the tongue with the fingers, thereby increasing the tendency to breathe through the nose;

Third: by placing in the dorsum of the mouth a long folded and stitched gauze sponge which prevents the passage of air through the mouth. In the later cases the respiratory valve is left open.

VOMITING AND NAUSEA.

Vomiting, although not occurring often, may be one of the most annoying conditions which we encounter. If vomiting actually occurs during any stage of anesthesia, and the mouth and throat is filled with solid food particles, it is wise to discontinue the anesthetic for a few moments, allowing time to remove all food debris from the air passages.

Vomiting during anesthesia is possible only when anesthesia is light. When the tendency toward vomiting is noticed anesthesia should be deepened, because light anesthesia stimulates the vomiting centre.

Nausea after anesthesia is always the result either of too recently partaking of food, or as will more frequently be the case when patient is afflicted with some form of stomach trouble. In practically all cases of post-operative nausea, when Nitrous Oxide and Oxygen has been used, a history of easily induced nausea will be discovered.

DIFFICULT CASES.

A certain percentage of what may in passing be termed difficult cases will present in our practice. They usually require application of special technic to produce satisfactory results. A great many secondary reasons are found for these conditions. The environment of the patient, occupation and habits exert a marked influence.

It will be commonly noticed that doctors, dentists and trained nurses as a class, take anesthetics in which the nervous tension under which they live will be reflected. Locomotive engineers, firemen, chauffeurs, etc., usually after anesthetics narrate some dream of a violent nature in connection with their occupation. Men addicted to the use of great quantities of tobacco and alcoholic beverages, and patients who are addicted to the use of drugs, present the most difficult and troublesome cases which we see. The immediate reason is that the amount of N_2O taken up at ordinary atmospheric pressure is not sufficient to cause anesthesia.

Sometimes we find it advisable to employ some other than a general anesthetic in these cases, but on the other hand occasionally some condition dictates the use of a general anesthetic. The patient

who has recently been the victim of some violent accident lives over in his dreams the harrowing incidents, and adds to the difficulties of the anesthetist. In practically all of these cases it will be found that the patient will tolerate but a very small percentage of Oxygen especially in the early stages of anesthesia.

Relaxation does not occur until the anesthetic has been maintained for some time.

A slight degree of cyanosis is necessary if anesthesia is to be maintained; it serves as a guide; however, the degree must not be such as to modify respiration.

RESTRAINING THE VIOLENT PATIENT.

In the administration of general anesthetics, the manner of restraint for the patient who becomes violent is a subject which should receive careful consideration.

When administering a general anesthetic to a patient we assume responsibility for his well being.

If the patient is beset by hallucinations which make him violent, we must apply restraint with the object not only of preventing him from doing violence to those present, but also to prevent him from injuring himself.

Occasionally a patient is seen who seems possessed of super-human strength and it requires the greatest physical effort to prevent the patient from getting out of the chair.

Various methods of restraint have been suggested and tested including straps for the wrists and ankles and also straps for around the abdomen. I advise against the use of all these, not because they will not restrain the patient, but because it is possible for the patient to injure himself. A narrow strap around the abdomen might easily cause the fracturing of a rib of a patient if he exerts sufficient strain against it. And, fracture of the bones of the arms or legs might also result when narrow straps are applied. Any method of restraining by arm holts about the neck is ill advised; they are never successful and are exceedingly dangerous. It must be remembered that the patient may be partly anesthetized and may easily exert sufficient force to cause injury.

After much experimenting I have adopted a large linen band of roller towel material, eight feet in length. This band can be placed over the entire abdomen and breast. It is not necessary that the patient know it is for the purpose of restraint; after the anesthetic has progressed, the towel is knotted behind the chair. I have never known this to fail and I have never had patients complain afterwards of soreness because of its use.

THE GAS MACHINE.

The gas machine should be carefully selected. It should be con-

structed in such manner that instant control is maintained at all times over both gases.

It is a wrong principle that changes the volume of gases when a change is to be made in the supply of oxygen.

Single valve machines which do not permit of independent control of the Oxygen and Nitrous Oxide, cannot be successfully used in dental practice.

The machine should always be perfect in all its parts. There should be no leaky bags or tubes.

The inhaler should not be worn out nor softened.

Silk covered tubes should not be permitted. Very often the rubber is completely destroyed, the silk conceals this fact, and it is impossible to administer a good anesthetic under these conditions.

THE ASSISTANT.

An assistant capable of observing and thinking quickly is necessary in the administration of anesthetics. It is not necessary that the assistant shall be an anesthetist; she should not be required at any time to assume responsibility. Her duties should be entirely to carry out quickly and precisely instructions regarding the gas mixtures given by the dentist after he has begun operating.

She should be familiar with the working of the particular gas machine with the inhaler.

She should understand the importance of preventing leakage of atmosphere into the mixture, or loss of the gas around the inhaler, or through leaky tubes.

She should be instructed to the effect that no matter what the operator does she shall keep the margins of the inhaler in close adaptation to the face.

Confidence is born of experience, and as one grows in experience he really finds that, especially for cases of short duration, there will be few contraindications.—The Journal of the National Dental Association.

A Biologic Aspect of Peridontia*

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THE purpose of this paper is to renew interest in a problem of dental practice which is already familiar to you all. An endeavor is made to emphasize and elaborate one simple yet essential clinical hypothesis. It is believed that its practice is not new to some periodontists, judging from many of their "finished cases"

*Read before the Connecticut State Dental Association, at its annual meeting in Hartford, April 15, 1919.

which it has been my pleasure to examine. It is also believed that this hypothesis has never before been presented to the profession.

Biology is the science of life and of living things. The observation of its laws is an important factor in the success or failure of every case which the periodontist is called upon to treat. Life is a continuous contest between the organism and micro-organisms. The eventual death of the organism is proof that the micro-organism is in every case the victor. In treatment the clinician is dependent upon the forces of life which are set in action as the result of his operation, even more perhaps than upon the particular application of technical skill which is an accomplishment of his hands. It is entirely because the patient has life and because that life will react to treatment that we sustain our interest. A cadaver may be treated as skillfully as a living person, but where would be the incentive?

It is my purpose to refer here but casually, or only as necessity demands, to the pathology of dental periclasia. Pathology at its best is a pessimistic science. Pathologists accentuate the morbid, revel in results of disease, and look upon death as the inevitable reason for life. To the pathologist all life is woe and leads directly to the grave. There is as much difference in practice between a dental pathologist and a periodontist as there is between an undertaker and an osteopath. While it is essential that we understand and keep abreast of the work which is being done by the dental pathologists, we should not let this morbid science stand between our clinical skill and ultimate success. The writings of the great dental pathologists, Miller, Black, and Talbot, never exhibited any optimism upon the subject of the management of cases. The whole problem of treatment hangs upon the biologic, not the pathologic.

To the clinician, in the management of cases and particularly in diagnosis, some of the questions which are of greatest import are—

How much of the regenerative activity still exists in the remaining pericementum?

Can its constructive activity be reawakened?

Can the factors or forces which have been responsible in producing or causing the condition be eliminated?

Let us for the nonce stand upon the extreme right instead of upon the extreme left. Let us remove our backs from the sun and our own shadows from the canvas, so that unobstructed light may fall without a shadow full upon the picture.

All bioplasm is continuously under the influence of two distinct forces, one which is constructive, leading always in the direction of the normal, the other regressive. These two forces are continually at war. From the single living protoplast up to the most complex organism with its complicated structures, this contest results in a succession of changes which is commonly called cell activity. The con-

structive activity results in development of the organism and a continuity of structures. New living structures are being stimulated into form by the function of the part, while matured cells which have withstood attack are being replaced. Living cells need nutrition to endure. Nutrition is maintained by function. When function is reduced in some degree, changes occur which result in atrophic degeneration. The biologic law which seems to govern cell function seems likewise to govern the grouped cells of an entire organism. Thus we observe that the cementum cells are differentiated as cementoblasts and cementoclasts, while morphologically there appears to be no microscopic distinction. The honey-bee will serve as a biologic example of a dual or multiple function in a single specimen variety. One group of bees will function as honey-gatherers, another group as comb-makers, etc. Instances of this kind occur throughout the whole biologic field of study.

When tissue is injured, provided the structural identity is unchanged, there begins a process which is called inflammation. Like the cementum cells and the others which both tear down and carry away, as well as reconstruct and build the cementum, so inflammation is at once a process which results in tissue atrophy while at the same time it is fighting to re-establish normal conditions.

It has been held by some (myself included) that the processes which destroy the periodontal tissues are not essentially of an inflammatory character. But after reading Adami's classic upon this subject ("Inflammation," by J. George Adami, Macmillan & Co.) I stand converted, and now believe that dental periclasia is essentially an inflammatory process from its inception in the subgingival space to the possible exfoliation of the uncared-for tooth. To the four cardinal symptoms of inflammation—heat, redness, swelling, and pain—Adami adds a fifth, viz: "disturbance of function brought about by departure from the normal condition of the region." While under favorable conditions, where the region injured is dense or less vascular or where the injury is less severe, "one or all of these symptoms may seem wanting, nevertheless a minute examination of the tissues will show the same succession of changes which possess all of the four cardinal symptoms."

DIAGNOSIS OF PERIODONTOCLASIA.

To the operator in dental periclasia a knowledge of the intimate histology and pathology of the tissues which are to be treated is assuredly of importance in arriving at a correct diagnosis. And without a full and complete diagnosis of each case which has been made in advance of its treatment, a diagnosis which will give the operator a clear and definite objective together with the reasons why he should proceed in the manner laid down as correct and true, there will be no science in the result, even if by chance a cure should be

effected. All treatment must be backed by a careful study of causes. It is a generally accepted axiom that the successful treatment of disease depends upon the removal of its cause. In dental periclasia the initial attack is an invasion of micro-organisms into the border of the subgingival crevice. But, to have an invasion, tissue must be prepared for the invasion by some attack upon, or an injury to, the cells of that tissue. The preparation for an attack may arise from many causes; it may be mechanical, chemical, bacterial, or simply a disturbance of function, as when through disuse the atrophic changes cease to be reactive and the cell resistance becomes lowered (as in disuse atrophy) through sheer inanition. There are also observed irritants to the gingival border which appear to be so mild that little or no immediate cell destruction results from their action. Nevertheless, in a very great majority of gingivitis cases there is macroscopic evidence that the dual processes degeneration and destruction are co-active.

For this interval we shall change our viewpoint, as I have already stated. We shall study the biologic problem as it may be applied to treatment in dental periclasia. The farmer, the gardener, the forester, the surgeon, *et al.*, and particularly the periodontist, each recognizes certain changes which occur and which follow inevitably every act he performs in the treatment of the particular kinds of structure which he attempts to cultivate. These persons, whose vocations are so varied, all operate under the same biologic laws which govern all cell action. Each in his separate field has observed that if certain things are done or happen under the same conditions and combination of conditions, there inevitably follow certain changes in the cells of the organism. Thus the farmer knows that he must plow his soil and prepare it for the living seed which he proposes to sow; that the seed must have food, water, nitrogen, etc., to be able to develop and to grow. He takes from his experience and knowledge that which he has learned from repeated observation and practice, and applies it to the object of his care. This knowledge comes from an observance of the natural or biologic law as it has been revealed to him from his education and experience. The more nearly the farmer is able to interpret the natural desires or impulses of his corn-field, the greater will become his reputation as a successful farmer, and the greater his yield.

Let us illustrate one point by the application of an analogy. Let us pay a visit to the gardener, for instance, the professional highly trained gardener, of whom the Scotch furnish perhaps the best example. Here is a true biogenous clinician who is practising a profession; his whole life is devoted to the propagation and protection of growing things. We are, let us assume, a party of four—you, your son, the gardener, and myself. With evident pride and plea-

sure the gardener displays the products of his laboratory. The boy and I observe that consciously the gardener is continually using an implement, digging and loosening the earth about the roots of his plants; picking off branches and buds; pulling up whole plants and casting them aside. It is my observation that each act of this description is performed with a definite intention as a part of his plan or scheme for the development of certain organisms. Not so the boy. Being intellectually immature he fails to grasp the true significance of the gardener's acts, and observes to himself, "Sure, I could be a gardener! I can do that as well as the gardener. I can hoe; I can break leaves and buds; I can pull up plants; I could be a gardener—sure!" I trust it is not necessary to carry the similitude farther to illustrate my point, nor to finish my story, by telling you that the results of the boy's operations in gardening, when put into practise, were not the same as that of the gardener whom he thought to imitate. Yet the boy did ostensibly the same things. But for fear you may miss the application, I will say the biologic problem is identical in principle whether it is applied to the growth of plants or to the investing structures of the teeth.

Living things are all composed of cells. All pathology is cell pathology; all histology is cell histology; all biology is cell biology, and all cell life is governed by the same fundamental laws.

Who among us has not observed, I might say experienced, the same disappointment as the boy, when we failed to accomplish results similar to those of some expert clinician? An observer at a pyorrhea clinic sees an operator planing a root-surface and understands that the intention in the operation is the thorough removal of all septic debris. He inquires as to the type of instruments being used and where they may be procured, notes the manner of their use; takes heart and encouragement, satisfied that once he has had an opportunity to perfect his technique, he will achieve success in treatment. But does he not miss the real significance and application for the necessity of such treatment? There are conditions where the planing or curetment of a root is contra-indicated. There are certain conditions where the combination of factors are as certainly set against a successful operative result as when the two red semaphore lights are set against a railway engineer when his train approaches a closed block of track. Every operative act should be an intelligent service. It should never be a stupid attack upon an organism. That root surgery could at any time or under any conditions be the wrong thing in the treatment of one periclasial tooth and be indicated by the necessities in another, may appear to some as an absurd statement.

To keep the biologic idea clearly before us, we shall return to the garden for our analogy and later take up its application to the tooth. We shall assume that it has been raining for a week; the soil in the

garden is not simply wet, it has become soft mud; true, there are weeds which should have been removed ten days ago. On the morning of the seventh day of heavy rains, the "boy" says, "I shall now go out and hoe, because the garden needs hoeing." We may all admit the contention that there is necessity for hoeing, but we also know that hoeing in a garden at this time and under the conditions of slop and mud could be reasonably said to be contra-indicated. The soil must first dry out a bit. To work wet mud soil with a tool would actually retard and upset the development of plant organisms.

In the whole biologic field the etiologic factors leading to retrograde changes always occur in groups. Dr. John Oppie McCall, of Buffalo, New York, was the first to call attention to and apply this fact in periodontia. This postulate of McCall's, stated from memory, runs like this:

The etiologic factors which are responsible for the various manifestations in periodontoclasia are six in all. The first four are primary and the fifth and sixth secondary, or non-inaugurating. Of these six factors any two or more may be present and contribute to the cause and development of the condition, but never any one factor singly.

Now to return to our muddy garden. What are its necessities? What are the diagnostic findings? The first fact established is that it is too wet; this will be corrected naturally when the rain stops—in other words, it is a factor which is not within the power of the operator to remedy. Second, the garden needs sunlight, not only to take up the excessive moisture and to dry out the soil so that it may be "worked," but it also needs the sunlight as a food element. Third, it needs food liberation, viz: air, moisture, nitrogen, and certain nutritive mineral salts of soil. So much for the diagnosis.

We shall next consider treatment; operation should be postponed until the soil dries out. All weeds should be removed, for weeds take up the food elements which are needed by the plant itself: the soil about the roots must be kept mellow and light so that air may enter. It is surely unnecessary to go farther into this subject of practical horticulture in order to show the close analogy of this to periodontal diagnosis.

We shall take for our dental example a typical "pyorrhea," one of those cases where there could be no dissension by one who perhaps had never used nor understood the meaning of the newer and more generic term "suppurative periodontoclasia."

Clinical examination of this tooth reveals a right upper cuspid which is more than a little loose, yet not so loose that it may be rotated in the alveolus by a twisting motion of the thumb and finger. Transillumination and the electric current tests show conclusively a vital

pulp. The radiograph shows a marked destruction of alveolar process which extends into the apical third of the length of the tooth and to within a little less than 2 mm. of the apex. This rarefaction appears over the region of the distal alveolar wall. Probe examination coincides with the radiographic findings as to location and depth of the pocket. Passing a curet over the root surface of the pocket reveals hard deposits which extend only to one-half of its depth. A small quantity of whitish yellow pus is exuded by milking pressure, but the flow is not copious. There seem to be no acute symptoms reflected to the overlying vascular structures of the pocket. An examination of the occlusion shows a mutilated class I malocclusion. The contact relation of the occlusion of this tooth shows a marked traumatic occlusion with its opponent in the lower jaw.

PROGNOSIS AND INDICATIONS FOR TREATMENT.

The two coexisting primary factors which are within the power of a periodontist to correct and eradicate are the traumatic occlusion and the obviously septic root surface of the pocket. The other factors necessary to restore this tooth to a state of health are biologic and outside of the control of the operator. The excessive impact of the lower tooth causes the displacement of the tooth which we have under discussion, which is literally driven outside of its normal position each time the jaws are brought into occlusion. We have then (1) an infected tooth-joint, with (2) motility of the tooth. This motility is the block signal already mentioned, which is set against every effort of constructive cell action or healing.

This motility is analogous to that of a broken tibia, inasmuch as there can be no regenerative effort upon the part of the organism until physiologic rest has been secured. A broken tibia demands fixation by the application of a splint, and physiologic rest for bone repair. The tooth demands relief from traumatic occlusion and physiologic rest from pericemental shock, which has by its almost continuous action caused the cell death of a large portion of the immediate investing structures, leaving the remaining vital or semi-vital cells in a state of lowered resistance. The indications for operating surgically should always be preceded by a valuation as to the etiological importance of the several necessities of the organism.

The relative biologic importance of the two factors which complicate this case, and which are the only two factors within the remediable scope of surgical interference, should not be difficult to determine. It is not that one factor is not important, it is the sequence of their significance—their relative importance. It is with such a combination of clinical findings as are here made, that root curettage would be contra-indicated as the preliminary attack. It would be contra-indicated for the same biological reason that the "working of the soil" of a too wet garden would retard development of plants,

it would be contra-indicated for the same reason that a cotton-and-bandage dressing would be contra-indicated instead of a proper fixed splint in the case of the broken tibia. To be sure, we may also pull up a few weeds, and make an effort to drain the wet soil. That is to say, we may remove septic debris and concretions from around the neck of the tooth in many cases without increasing the strain on the periodontal tissues, and we may prescribe a suitable mouthwash and rational mouth toilet in order to reduce the congestion in these structures.

A case which has suffered from prolonged traumatic occlusion needs, above all things else, physiologic rest. This may usually be accomplished by grinding the affected tooth. The method of treatment of traumatic occlusion is too big a subject to be included here. (The technique of treating traumatic occlusion was described and published in the *Journal of the N. D. A.* for July, 1916.)

It has been previously stated here that "when function was reduced to a degree, degenerative atrophic changes occur." Normal function is the physiologic office which nature gives to structures for the continuance of life within the vital organism. The principal function of our teeth is mastication, and this may only be maintained by a normal relation of the occlusion of jaw with jaw. Traumatic occlusion has been mentioned as a pernicious relation leading to periodontal infection. Its relation to occlusion could be correctly stated as occlusion⁺, plus or super-occlusion. Normal occlusion where there is no interference with function then could be represented by the sign 0, or zero, as has been done in the thermometer, the sign being one that has been fixed at an arbitrary place upon the glass. Under the sign of occlusion—(minus) then would fall all those teeth which were not in function and therefore do not have the health-giving benefits of an innoxious occlusal relation. Dental periclasia which has at the same time a contributing disuse atrophy could then be placed under the minus sign (—). If the line of normal be represented by the sign 0, or zero, super or traumatic occlusion would range in degrees above the line, and all disuse cases would fall below the line, under the minus sign. This latter class is by far the most difficult type which the periodontist is called upon to treat, for the reason that in all of these cases the restoration of function is a difficult problem. The subject of dental disuse atrophy with its accompanying infections is of sufficient size and importance to demand a separate paper.

Successful treatment of dental periclasia is being withheld from quite a large group of our profession by the fact that they know so much about the subject which is not true. By far the larger number of those who are happy in periodontic practice and with the results of their clinical efforts never attempt to write of their successes nor to

go into print. They say to those of us who do, "Why do you waste the midnight oil? You know you have nothing new to tell the profession; why waste your time?" We answer, "Truth can afford to be reiterated and repeated forever, if necessary, for truth is ever new." But there is a constant attack upon the established methods of organized periodontia by a certain type of pseudo-scientific charlatans and their following. These doubters, these exploiters and dupes of exploiters, chasers of some cure-all, some home treatment, or some "easy method," are always to be found upon the side opposed to right. It is in a spirit of opposition to them that a few men have taken to the platform to combat these false prophets. The members of the American Academy of Periodontology hold collectively some truths which are fundamental. Its members are in accord upon this fact, viz: that there never has been and there never can be a successful cure-all in any drug or combination of drugs; any serum, or a single product of the bacteriological or chemical laboratory; there will never be invented any device, apparatus or machine which will satisfy all requirements in the treatment of dental periclasia; and the reason is that every case of dental periclasia presents in itself a somewhat different and distinct biologic problem.

Between the fad methods and systems of treatment which have been already exploited and the management of cases in the offices and clinics of the ethical specialists in periodontia there is hardly an essential point of similarity, while the dissimilarities are so great that to couple or compare one with the other in a discussion of the subject would disclose scientific ignorance thereof so nearly complete as to be almost admirable. As a matter of fact there is nothing mysterious in the standardized and accepted management of cases. The sequence from cause to effect in correct diagnosis and treatment is visible and invariable, and that is all that can be said of any other phenomenon in biology. The whole secret of a broad success lies in diagnosis. The joy in periodontia lies in *doing* those acts which are indicated; the satisfaction, in knowing that one's pre-operative study and diagnosis have been proved correct by cases recovering their health after treatment.—*The Dental Cosmos*.

Association of Military Dental Surgeons of the United States

OFFICERS for the present year have been elected as follows: Dr. E. P. R. Ryan, President; Lt. Com. J. L. Brown, Vice-President; Dr. R. W. Waddell, Secretary-Treasurer; Dr. Wm. C. Fisher. Council members: Dr. John D. Millikin, Dr. Wm. C. Fisher.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

SUPPLEMENTING RADIOGRAPHY WITH BLOOD TESTS.

RADIOGRAPHY has done much to improve dentistry. It has its limitations, however, and there is the possibility that we may take too hopeful a view regarding the outcome of our dental treatments in difficult or obscure cases, when the prognosis is based entirely upon the radiographic findings. If the promised benefits do not accrue, the patient, as well as the dentist, is disappointed. Much unfavorable criticism of our profession is occasioned in just this way. We are all anxious, therefore, to know why failure attends some of our best efforts.

In attempting to explain this, let us review briefly, the routine followed in the average case. We shall assume that the patient has been examined and possibly treated by one or more physicians, who, failing to effect an improvement in the patient's condition by the usual methods, refer the case to a dentist. It is only after various treatments have been tried and found wanting that the possibilities of dental treatment are thought of. It is true that all cases do not answer to this description, but, unfortunately, a great many do. The dentist now takes charge and, of course, makes a thorough examination of the tissues of the mouth. He notices whether the patient breathes properly and makes enquiry as to systemic conditions, obscure pains, etc. Then a full radiographic dental series is made, including the sinuses, because they may possibly be involved. This radiographic series will show rarified areas of bone, canals improperly filled, pyorrhea pockets, large areas of necrosis, cystic formations, etc.

Now, many practitioners will be satisfied to stop with the radiographic disclosures and commence treatments according to their findings. This is where we are at fault, and seriously so, for this reason: the patient has been referred to us because of systemic conditions that may be very obscure, so much so that possibly more than one physician has been nonplussed as to its cause. Is it reasonable, then,

for us to expect the whole situation to be immediately clarified by dental X-ray examination alone?

Even supposing the ailment proves to be a more or less clearly defined case of arthritis, neuritis or gastro-intestinal disease, can we say to the patient that we have found infection in the mouth and that its elimination is imperative in order to effect a cure? In a few cases, no doubt, the patient will gladly consent to the removal of teeth, that to him appear healthy, but some will object to this operation because they know of many cases where the removal of teeth has not brought any benefit to the sufferer. Indeed, the mass of evidence against this method of treatment is getting to be very bothersome. What are we to do?

In *The New Jersey Dental Journal* there recently appeared an excellent paper by Angelo Zabriskie, D.D.S.,—"Complement Fixation Tests As Applied to Dental Practice"—in which he refers to this very problem. He says: "We show the patient the radiographs and the areas of suspected trouble, but even this is not convincing, because he knows of another man who followed the advice of the removal of teeth or the opening up of a sinus and derived no benefit whatever. Must our answer be that the radiographs show infection and that, on general principles, it should be eliminated, and that after two or three months, if the systemic symptoms are still present, it would be well to look elsewhere for the trouble? We might also say that if the teeth are involved, the worst ones could be removed and have the rest treated, or have them all treated, and then, if systemic symptoms failed to disappear, have them all extracted. Or, if the radiographs showed a satisfactory clearing up of the infection after treatment, a regeneration of bone, a diminution in the size of the granuloma, or a perfectly filled root-canal, that the systemic condition is surely from another cause and cannot come from the teeth. All this is very unsatisfactory. We know it, and some patients will find it out sooner or later." Certainly this is not a very flattering portrait, but, unfortunately, it is very true to life. If we do not stop in our tracks and cease promising the impossible we shall lose public confidence, and that is a serious thing.

Dr. Zabriskie tells us that we must consider the effect of the foci of infection on the general system. The effect is practically the same, whether the infection comes from the teeth, accessory sinuses or tonsils. This is how he views the whole problem: "The blood and lymphatic circulation, we believe, are the carriers of the causes of systemic disturbances. The bacteria themselves are formed in the foci and here they grow, reproduce themselves, assimilate food in order to live, and excrete something we term toxins. These toxins are taken up by the blood stream and immediately the natural forces of

nature are called into play to counteract or neutralize these toxins. This is very satisfactorily done for a time. The time may be short or it may extend over a period of years. This we cannot tell, as it depends upon the virulence of the bacteria, the condition of the patient, his mode of living, his diet, the amount of exercise and sleep and various other things too various to mention, and a good many causes that I do not believe we are aware of at present. The toxins, but not the bacteria, are present in the blood stream. If the bacteria were coursing through the circulation and propagating there, we would have a true bacteremia and death would ensue within hours, instead of weeks or years, as it does in toxemia. Therefore, we have only toxemia to deal with in the majority of our cases. If there are other foci of infection in the body, we still have toxemia, but the toxins may be of a different nature, according to the different nature of the bacteria. For instance, one may find tooth infection that produces streptococcus and a venereal infection that produces gonococcus. While these germs are not in the blood stream, their toxins are. Hence we have toxemia and so-called infection."

It will be readily observed, then, how futile it is for any dentist to promise a cure for systemic ailments, unless he has found out the nature of the infection and assured himself that the treatment comes within the range of dentistry. If the dental radiograph is not sufficient in its scope to give us this information, then we must look elsewhere for it. We must look for all sources of infection that are sapping the patient's energy. In this way we shall be better able to help them. With our present system there is too much speculation. We are working in the dark, hoping that by the extraction or treatment of suspected teeth, the systemic ailments will disappear. Sometimes they do and we congratulate ourselves; sometimes there is no improvement in the patient's condition and then our methods are condemned.

To show the importance of clearly identifying cases of mixed infection, Dr. Zabriskie says: "When diphtheria bacillus is grown alone in the laboratory it grows just so fast, and when streptococcus grows alone the growth, we say, is normal, but when diphtheria bacillus and streptococcus are combined the growth is increased above normal. Therefore, tuberculosis and strep., gonococcus and strep., or several foci of different bacteria being present in an individual at the same time may be a big factor in the diagnosis, treatment and prognosis of disease. I think that when we have some other infection of the body, and if there is a streptococcus infection accompanying it, whether it be from the teeth, tonsils or accessory sinuses or elsewhere, our prognosis will not be as favorable and the case will not clear up as it would if the strep. were removed as early as possible,

or it it were not present at all. We know of the high death rate in the recent epidemic of influenza and the resultant pneumonia. In these cases of septic pneumonia, streptococcus is found. Have these patients a focus of strep. somewhere in their bodies? Is it around the teeth? Possibly. And would the great number of deaths have occurred and would the pneumonia have developed a septic type if the patients had not had the focus of strep. that has been present for years and never caused any serious disturbances? There was only a toxemia that the system was successfully combating until the acute infection of influenza manifested itself. The general tone of the system was lowered, the strep. helped the other bacteria and the other bacteria helped the strep. and death ensued in several days."

To show the necessity of our looking for more information than can possibly be given by dental radiographs, Dr. Zabriskie recalls several cases which came under his observation. One of these, a female, suffering from arthritis deformans, showed tooth infection. The Wasserman was negative, the complementary fixation gave a four plus streptococcus and a three plus gonococcus. Now, it will be readily observed that if attention is directed solely to the dental infection, little or no progress will be made in such a case, but if both sources of infection are recognized and treated, then satisfactory results may be looked for. Another case: A male, 38 years old, for four years in poor health, had severe attacks of boils on his back and neck, teeth were suspected. Patient's condition became so critical that the wholesale extraction of teeth was advised. Radiographic examination of teeth showing nothing. Blood test showed that there was a positive colon bacillus reaction when a complement fixation was made. Wasserman and every other test was negative. The fact was established that there was no strep. infection. Radiographic gastro-intestinal series showed a complete gastro enteroptosis. A floating kidney was found and a stone in the bladder was later demonstrated. What possible good would the removal of the teeth have been under such conditions? A third case: Female, about 28 years old, illness extending six or seven years. Teeth were suspected. Patient had appendix removed, but old symptoms of hysteria, neuritis and neuralgic pains continued. Impacted third molars were removed. Before further dental treatment was undertaken, a blood test was made, showing Wasserman four plus, gonococcus three plus, streptococcus four plus and two plus staphylococcus and catarrhitis. No person would be rash enough to predict that dental treatment alone would clear up this case, yet it is certainly part of the treatment. Without a blood test, the dentist would carry on his dental treatments in complete ignorance of the true cause of the patient's ailment and failure of his efforts would be assured.

Many cases referred to us by physicians show conditions of marked gastro-intestinal disturbances. Now, in this connection Dr. Zabriskie raises this important question: Was the tooth infection primary and did the toxemia resulting so lower the general tone of the body that the gastro-intestinal condition was the result. Or was the toxemia due to the gastro-intestinal condition primary, and did this so lower the resistance of the tissues around the devitalized teeth that they became readily open to infection?

The answer involves the pros and cons of root-canal filling and the desirability of retaining devitalized teeth. It would, therefore, be useless to review here the various views held regarding this important question. We know, however, that our readers will be interested in having Dr. Zabriskie give us his answer to the question: Can we safely treat infected teeth so as to eliminate systemic infection? He says: "Yes, providing that after treatment we can show a negative complement fixation of the blood after first having demonstrated that the infection was originally from this source. Perfectly filled root-canals are not immune to infection, and if any dead tooth is present where there is systemic infection it must be regarded with suspicion. There is no reason why root-canals can not be treated, why teeth can not be devitalized, providing they will never cause infection. If infected teeth are treated with a view to eliminating infection we must be able to show that the toxemia, if it is in the blood, has been eliminated and that no toxemia will be a result thereof."

A blood test, together with a radiographic dental series, seems to be imperative if a dentist is to undertake the successful treatment of the various ailments which come under his care. Whether such a test had best be made by the dentist or the physician or by one trained especially for this work, depends to a great extent upon conditions of his practice.

The criticism most likely to be offered as a result of any plea for blood tests is that the physician will have made it long before referring the patient to a dentist. Some may do this, no doubt, but it becomes the duty of the dentist to find out if such an examination has been made and insist that all facts be placed before him. If this becomes a customary practice and not an unusual one, as it certainly now is, then we are not likely to expose ourselves to ridicule by attempting to treat cases, the nature of which is a mystery to us. Here again we have shown clearly the need for co-operation between the two professions.

Personal Sketches of Canadian Dentists Who Served in the War

THE part that Canadian Dentistry has played in the world war is, in the aggregate, the personal experiences and worthy efforts of Canadian Dentists who served in the Canadian Army Dental Corps or other branches of the service.

Dentistry would like to know who these men are, and we urge upon every member of the profession, who enlisted in the C.E.F., to send to Oral Health the following information, immediately upon discharge from service:

Name in full, with rank.....

Place where engaged in civilian practice.....

Date of graduation and name of college.....

Married or single.....

Date of enlistment.....

Date of discharge.....

Unit

Character of service, and other information of interest.....

.....

Photograph.

Every man should consider it as a duty to his profession to assist, in so far as he is able, in completing the dental record of the war. We appreciate the feeling of reluctance which all the men possess, when asked to speak of the service they have rendered. However, this very commendable diffidence should not be permitted to interfere in any way with supplying the information requested, to the end that a fairly complete history may be secured of Canadian Dental practitioners who served in the war.

Oral Health plans to publish one or more of these "Personal Sketches" every month and we trust they may not only prove of great interest, but will be of inestimable value when Dentistry's part in the great war comes to be fully recorded.

—Editor.

* * * * *

MAJOR O. A. ELLIOTT, D.S.O.

Major Elliott enlisted at the outbreak of war, and signed up in the Canadian Army Dental Corps. He served in England from April 1915 until he went over to France in September 1915. He



The above is a photograph of three of the Elliott brothers, of Toronto, who enlisted for service. From left to right they are: Fraser (C.F.A.); Orville (C.A.D.C.); and Alex. (C.A.D.C.). Fraser Elliott is not a dentist, having chosen law as his profession. Dr. Foster Elliott, another member of the family, is a dental practitioner.

was attached to the 5th Field Ambulance and remained with the same unit until the close of the war. He was the only original officer of the 5th Field Ambulance left with the corps. Major Elliott was wounded in November, 1917, and received honored recognition in being awarded the Distinguished Service Order in October, 1915.

CAPTAIN ALEX. ELLIOTT.

Captain Elliott enlisted in the Canadian Army Dental Corps in England during October, 1917, and served for some months at Witley and Orpington. For the balance of the time Captain Elliott served in France.

Discharged in May, 1919, and now in practice in the City of Toronto.

Nursery Parodies

There was an old woman who lived in a shoe,
She had many children, but she knew what to do.
She gave them their suppers of milk and brown bread,
And cleaned all their teeth ere she sent them to bed.

Little Tommy Tucker, sing for your supper.
What shall I sing for? Brown bread and butter.
How can I chew it—my teeth are so bad?
Get a brush and clean them, my dear little lad.

Little Bo-Peep has lost her sleep,
Her face is swollen, she cannot eat.
When she gets well 'tis safe to say
She'll brush her teeth well every day.



An Experiment That Failed

THIS is a wholly personal epistle. It need not, therefore, be read by those who care little for the personal experiences of others, and I imagine that most people are in this category. I was to take a trip from Chicago to the great Canadian Northwest to attend some dental meetings in Saskatchewan and Alberta, and the prospect which under ordinary circumstances would have delighted me beyond measure, left me in the deepest depression. It was not that I did not look forward with the most pleasant anticipation to seeing my good friends of the prairie provinces, nor did I fail to appreciate the honor of an invitation to meet with them. But I was to make the journey alone, and this was what depressed me. It was the first long trip I had ever taken without having my family with me for company, and the prospect was not attractive.

So for diversion, I resolved on an experiment. Travelling alone as I was, I conceived the brilliant idea of pretending that I had committed some terrible crime, and then seeing how successfully I could escape. I had heard of criminals getting away and leaving no trace, and I figured that I could hide my identity as skillfully as most criminals. The great difficulty was to select the proper crime. I first thought of murder, but in Chicago this crime had become so common that there was no class to it. I wanted to do the thing up with distinction, and when I recalled the fact that there had been more than thirty murders committed in Chicago in a few days during the race riots, I concluded that this particular crime had been somewhat overdone. Then I thought of the hold-up and robbery, but this also had become so commonplace and every-day in character that there was no originality about it. Robbing a bank did appeal to me for a brief moment till I counted the number of cases around Chicago in recent weeks, and had to acknowledge that I was out-classed. Once started out on the enterprise, I was determined that my crime should be well worth while, and I accordingly canvassed

the whole category, only to be confronted with the humiliating fact that none of them seemed really unique or distinctive. Suddenly, I had an inspiration. I hit upon the most marvelous and heinous crime of all, and what was better, it was one decidedly dental. I would fill a pulpless tooth for a patient, and actually leave it in the mouth without cutting down through the jaw and dissecting out a piece for microscopical examination to count the number of death-dealing micro-organisms found lodging at the apex of the root. This, I figured, after reading certain articles on the subject and hearing the dicta of certain of our medical friends, was the very acme of all criminal procedures, and I was so obsessed with the desire to pose as a criminal that I determined to do this desperate thing. And so I left Chicago with the cloud of this terrible crime hanging over me, fully resolved that I was going to travel incognito, and see how far up the line I could get without having my identity revealed. It was a pleasing little experiment, and I entered into it with great enthusiasm.

The game was to start the moment I entered the railway depot to take my train. I had just said good-bye to the dear ones who came to see me off, and turned to lose my identity in the great moving mass of humanity who surged toward the gates, when I was suddenly greeted with—"Hello, Doctor, which train are you going on?" And my suit-case was grabbed from my hand, and the way led to the private gate, away from the crowd. It was one of my boys from the college, who was working at the station during vacation,—and let it be said parenthetically that this is the sort of boy who usually makes good—the one who works his way through college. The moment I was in the train-yard I looked across the track and saw my good old friend, Mr. Healy—"Dan" Healy—the very greatest dining-car conductor in the world—bar none. He has had charge of the dining car on the Pioneer Limited out of Chicago for more than thirty years, and if there is a single individual among all the travelling public who does not know Mr. Healy, I would like to see this individual and ask him where he has been buried for the past thirty years. Mr. Healy is the one original genius in his line. He looks after his "guests" with the most solicitous care, and he has done more to make the Pioneer Limited popular than any other one thing. When he saw me, he said: "Doctor, let the boy put your suit-case in the Sleeper, and you come with me." The diner is always filled instantly after the train starts, so Mr. Healy took me down the track and when the train backed in we got directly aboard the diner and I was soon seated comfortably. We chatted nearly all the way to Milwaukee, or as often as he could get away from his "guests," and he fed me almost to suffocation. But it all digested well, because it was savored with the greatest good will and the most solicitous care

on Mr. Healy's part. Long live Dan Healy—he is the salt of the earth.

Plainly, I was not getting on well with my experiment. But I said to myself that after I left Milwaukee I was safe, and so I went to bed gloating over my crime and secure from detection. The next morning as I stepped off the train at St. Paul, the first man I ran into was Dr. E. K. Wedelstaedt, who bundled me into his car and drove me to his home—just like being arrested, you know. I put in a most delightful day with Dr. and Mrs. Wedelstaedt, and forgot all about my crime. In the afternoon they took me to Minneapolis in their car, and I called on Elmer Best and Fred Kremer. Neither one treated me as if I were a criminal. I was feeling low-spirited at my failure so far, but consoled myself with the reflection that after I left Minneapolis all would be well. As the train pulled out for Winnipeg, I lay back in my seat and reveled in the certainty that not a soul on board knew me and not one was conscious of the crime I had committed. At last I was making headway with my experiment, and—"Well, I declare, if here isn't Dr. Johnson." I looked up guiltily and saw standing over me a gentleman and a very sweet-faced girl—Dr. A. M. Harrison and his daughter, of Rockford, Illinois. They were on their way up to the Canadian Rockies, and fate framed it that they should be on the same train with me. But I am sure they never suspected me of being an escaped criminal. The romance was oozing out of my experiment, but the pleasure was creeping in.

At Winnipeg, I left the train to take a taxi from one station to another. "Hello, Doctor, what kind of a trip did you have?" It was Dr. Taylor—Dr. Wm. F. Taylor—or rather "Bill" Taylor, as he is affectionately called by his friends. I did not dream that Dr. Taylor knew I was still in the land of the living, let alone in the land of the Maple Leaf. He "had heard" that I was passing through, and thought he "would drop around to the station." He put me in his car, and we lived in that car all day long, with intervals of calling on friends and eating. No one would ever have imagined that Bill Taylor had an office that whole day. I saw Winnipeg and its environs as I had never seen them before. It almost seemed as if William had learned of my crime and was determined that I should not escape. It was the most pleasant detention I had ever experienced, and I figured that being a criminal was not so bad after all.

We called on many of the Winnipeg men and visited the clinics of the C.A.D.C. We saw among others, Drs. Clint—the elder Clint is easily the youngest man of his years in the profession—Greenfield, J. F. Taylor, Bannerman, and others whose names I do not recall—all splendid men. The spirit of the West is typified by these men of Winnipeg and it is a spirit to be reckoned with. It is the spirit that

put down lawlessness and restored order in the recent strike. No one will ever know the heroism that was displayed by the citizens of Winnipeg at that time. These men, who were to-day showing me around Winnipeg as if nothing had happened, were at the time of the strike out of their offices for five weeks, doing duty for the city. A citizens' committee was organized to make Winnipeg safe and sane. Of course, Bill Taylor was in it. Bert Greenfield was a member of the improvised fire department—along with some of the best citizens of Winnipeg. "And a mighty good fire department we had," said Bert with a laugh. They delivered ice to the needy, milk to the babies, and looked after the comfort and welfare of the helpless in every way. Men turned over their finest automobiles to the committee for delivery wagons. One new Packard car was offered by its owner to take ice to the housewives—the only stipulation being that the men refrain from chopping the ice on the floor of the tonneau.

Is it any wonder that men of this spirit finally restored order in the face of the meanest foreign raid that was ever made on the rights of responsible government? Don't worry about Winnipeg. Her citizens are alert and no such nonsense will ever be tolerated again.

Dr. Bannerman took me to his office and showed me some of the finest furs I have ever seen. He is a sportsman of the highest type—by nature, by instinct, and by opportunity. It is invigorating to talk with him. He slipped in my pocket a pair of the prettiest moccasins a man—or a woman—ever wore. He also introduced me to a type of man I had always wanted to meet—a man in the employ of the Hudson Bay Company, who lives away up a few miles this side of the North Pole. His name was Mr. Flett—Alex Flett—and he is one of the noblemen of the North. It was the first time in four years that he had been out into civilization, and it was a rare treat to talk to him. He was quiet, unobtrusive, smiling, and soft of speech, as if the mysteries of the Great North Land had subdued him into a gentleness that was almost sublime. And yet there was that indefinable reserve force about the man that made one feel instinctively that in the emergencies and dangers of the North one would need no better protector than he. It was refreshing, in the tempest and turmoil of present day unrest, to meet a man over whom the unsettled tendencies of the age broke with so little effect, and who seemed superior to the smaller things of life. I found myself longing with an intensity which can never be appeased for an extended journey into the wildernesses of the earth, where I could remain secure from the clamor of modern life, where I could study nature at first hand and commune with the wild things of the forest and stream, where I could forget for the time the piercing scream of the steam whistle or the harsh crashing of an elevated train, where I could look up at the stars at night and listen to the sounds of the beaver building his dam, where time is not counted

by the seconds or the minutes, but by the revolution of the spheres, where—but hold—this is a vain dream which I must indulge no longer. I am a hothouse plant, spoiled and unseasoned by the cruel years of artificial life, and I must content myself to live out my allotted span minus a breath of that real life which is the daily portion of our good friend Alex Flett.

Such a day as I had in Winnipeg, and all because of the big-heartedness of Dr. Taylor. I am sorry for any one in the profession who has not met Bill Taylor. He is one of the princes of the earth. When the names of those who have lived for their fellowmen are written on the scroll, the name of Wm. F. Taylor will be well up on the list; and I can imagine that when Bill sees that he will get a ladder and begin to erase it, and then I can also imagine that the recording Angel will wave William back with a gentle smile, and write his name in larger letters than before.

Some one has said that the real art of writing is to know when to stop. I could go on writing of Winnipeg and her citizens interminably, but the limits of space prevent.

I think all will admit that my experiment failed, and I am unregenerate enough to be pleased that it did. In the next issue I hope to have something to say of the dentists of Saskatchewan and Alberta.

C. H. Johnson

Dominion Dental Council Applications From Overseas

AS quite a number of the men who are serving in the C.A.D.C. were still overseas at the time fixed by the Dominion Dental Council for closing applications for the Class "C" Certificates, it has been decided to treat the applications from these men the same as if they had been received on June 30th last. Therefore, all men overseas on date, 30th June, 1919, and who are entitled to a Class "C" Certificate may apply to the Secretary for the forms, and if the applications are found to be in order, certificates will be issued upon the payment of the usual fee of \$100; also all men serving in the C.A.D.C. and who were overseas at the time of the holding of the recent examinations and, consequently could not take such examination by reason of their absence, will be permitted to take the Class "D" examination this Fall, upon proving eligibility for such examination. The examination will start in each Province on Monday, the 24th day of November, and will continue until completed. All applications should be sent to the "Secretary, Dr. W. D. Cowan, House of Commons, Ottawa."

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TORONTO, SEPTEMBER, 1919

No. 9

EDITORIAL

The Dental Nurse

IN the Province of Ontario the term "Dental Nurse" is synonymous with "Trained Dental Assistant." The Dental Profession in Ontario, through its official body, has declared in favor of the *Dental Nurse*, rather than the *Dental Hygienist*, and has instituted The Training School for Dental Nurses of the Royal College of Dental Surgeons, for the purpose of training young women to act as assistants to Dental practitioners. Every Dental operator should employ a trained woman assistant, and thereby render a better service to the patient and at the same time increase the output of service. There is the same need in Dentistry as in Surgery, for the skilled operator to employ a nurse to carry on that part of the work where the Surgeon's skill is not required, thereby leaving the whole attention of the operator to be focused upon the actual operation.

In Canada the operation of prophylaxis is performed by the Dentist, and there are few more important operations in the practice of Dentistry, and none where the inexperienced or unskilful operator may do more serious or irreparable harm. Supporters of the Dental Hygienist movement admit these facts, but claim that it is impossible for the Dentists to cope with the present situation, and that the preventive hope of the future lies in the direction of the hygienist. How-

ever, the fact remains that if every Dentist employed one or more trained women assistants, the Dentists themselves would have ample time to render the efficient prophylactic and preventive service so much required.

Dental Reconstruction and Bolshevism

THE Editor has received a letter in which the writer commends in the following words Dr. Stengle's article upon the subject of "The Relation of Dental Affections to Systemic Disease," which appeared in July Cosmos and August Oral Health,—“So far as I have gone into Dr. Stengle's article, I find it much saner than most medical doctrine that is being taught to-day.” Dr. Stengle warns the dental profession that “we hear a great deal of loose talk about the teeth and the desirability of getting rid of them.”

The Dental Profession in these days of wonderful reconstruction requires the steady influence of conservatism. In the matter of the extraction of teeth, the pendulum has, in many localities, swung entirely too far, in the direction of ruthless extraction.

Reconstruction is popular. All good citizens are determined that a new order shall prevail, and are energetically discarding the old and building up the new, to the end that truth, liberty and justice may obtain throughout the wide world. And this same commendable spirit is abroad in Dentistry. Scientific recognition that septic conditions in and about the teeth lead to serious systemic disease, has forced a marked reconstruction of the principles and practices of Dentistry. One might almost say there has occurred a Dental revolution, so far-reaching have been the changes that have taken place in the practice of Dentistry during the past half decade.

This is all very good. But unfortunately “Bolshevism” has crept in, whose disciples of destruction see nothing but sepsis, disease and death in every pulpless tooth or gingival inflammation. A policy of indiscriminate extraction has resulted, with the consequent sacrifice of sound, healthy teeth, the marring of natural beauty, loss of comfort and serious depreciation in masticatory and digestive efficiency.

Unfortunately, there are Dentists who blindly follow the advice of medical practitioners, without making careful examination and independent diagnosis. They are *consenting parties* to these outrages, *without giving thoughtful and intelligent consent.*

Let us not forget that, notwithstanding the criticisms that are so frequently hurled at the Dental practices of yesterday, and in spite of the many failures and mistakes of the past, Dentistry has rendered in the aggregate an inestimable service to humanity and to public health during the past half century. We have occasion to feel proud of Dentistry's record and the many advances she has made.

It was recently reported in the press that the death of that illustrious world citizen, Theodore Roosevelt, was directly due to an infected tooth. It is such cases as this that serve in a striking though tragic way to bring home to the public mind the desirability and absolute necessity of maintaining the mouth and teeth in a condition of cleanliness and health. It is, however, the duty of the Dentist to take nothing for granted, but make a careful study and diagnosis of each case, and advise extraction only when such treatment is indicated. No Dentist, whether he be general practitioner or exodontic specialist, should in the practice of his profession receive instructions from a medical practitioner regarding diagnosis and treatment. Cooperation and consultation are essential, but, in the final analysis, it is the manifest duty of the dental practitioner to make his own diagnosis of the dental conditions present and then outline a conservative treatment best suited to the case.

Provincial Dental Board of Nova Scotia

AT the annual meeting of the Nova Scotia Dental Board, the following officers were elected: President, Dr. F. N. Ryan, Halifax; Vice-President, Dr. Frank Woodbury, Halifax; Secretary-Registrar, Dr. Geo. K. Thomson, Halifax. Executive committee: Halifax members of the Board.

Notes

Back Numbers of Oral Health

The following back numbers of "Oral Health" are desired by Capt. R. D. Thornton, care of Royal College Dental Surgeons, Toronto, for purpose of completing Library files, namely: February and March, 1919.

Dental Practice For Sale

Up-to-date two-chair equipment in one of the best towns in Northern Ontario, population six thousand. Excellent surrounding district. Monthly receipts average between eight and nine hundred cash. Sell at invoice cost of equipment.

For full particulars, apply to C. Ash & Co., Ltd., Toronto.

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Wanted—A Dental Graduate as assistant. Apply Box "A," Oral Health.

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public service it renders. * * * * **



HAROLD K. BOX, D.D.S.
Professor Oral and Dental Pathology
Royal College of Dental Surgeons

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, OCTOBER, 1919

No. 10

Arch Determination

J. D. McCoy, D.D.S., B.Sc.

IN this discussion of arch form, it should be borne in mind that we are considering arch form alone and not the relationship which the arches bear to the rest of the skull. This is important for unless this point is clearly emphasized, our vision is apt to become clouded and confused by instances of prognathous arches which at first sight might be construed as being architecturally entirely different from what we consider as being normal. A favorite example of such an arch quite popular with the exponents of the "Variations according to type" theory is the Fan Tribe of West Africa. Even if such arches should prove to be different, they should not materially affect our conclusion, for probably none of us will ever be called upon to do restorative work for members of the Fan Tribe of West Africa, nor will we care to reproduce in our patients such an occlusion. Even those who will cling to the theory of type and temperament must admit that our interest is centered upon arch form as we see it in normal well developed Americans. Before going into details as to the architecture of such arches it will be interesting to note the opinions of some well known authorities who apparently are reasonably in agreement upon certain phases of arch form which are of interest to us.

(Broomell) "The teeth are arranged in the jaws in the form of two parabolic curves, the superior arch describing the segment of a larger circle than the inferior, as a result of which the upper teeth slightly overhang the lower."

(Gysi) "The arches have the form of a parabolic curve, the incisors and canines of both arches form part of the arc of a circle."

(Talbot) "In the skull, in taking the two cuspids for the starting point the arc of a circle is found."

(Black) "The upper teeth are arranged in the form of a semi-ellipse, the long axis passing between the central incisors; occasionally the molars and bicuspid form a straight line instead of a curve and frequently the third molars are a little outside the line of the ellipse. * * * The incisors are arranged with their cutting edges forming a continuous curved line from cuspid to cuspid and this line is continued over the cusps of the cuspids and buccal cups of the bicuspid and molars to the distal surfaces of the third molars * * * The lower teeth are arranged similarly but on a slightly smaller curve, so that the line of the ellipse, which falls on the buccal cusps of the upper bicuspid and molars, will fall upon the buccal surfaces near the gum of the lower teeth."

(Tomes) "The teeth of the upper jaw are arranged along a curve of larger dimensions than those of the lower."

(Kingsley) "The normal type of the dental arch I conceive to be a regular line. The arch may be wider or narrower, varying somewhat in individuals or races, but the line will be an easy, graceful curve without a break or tendency to form an angle."

It seems to be quite generally conceded that the six anterior teeth describe the arc of a circle and the general form of the normal arch is parabolic in character. If we accept this our next concern would be to arrive at some definite idea of the size of the circle from which the arc is taken and the relationship which the arc bears to the width of the arch, its length, etc.

Of the more recent investigators of this subject, the work of Dr. Percy Norman Williams is of great interest and importance. In speaking upon the subject of determining the normal arch and relative proportions of such an arch, he says:

"In an attempt to determine upon what parts of the arch I should make measurements, it occurred to me that it would be necessary to locate the center of the circle described by the front teeth. I took a photograph of a normal arch, located the median line and moved the compass back and forth on this line until the other point would fall on the six anterior teeth; and invariably the center occupied a point midway between the molars. Acting for the time being on the assumption that the center of the entire arch might be at this point, I decided to take one measurement between the first molars, which I shall call 'A'. I also saw that the size of the circle in front was dependent upon the distance between the canines; that is if the front teeth occupied the arc of a small circle, the cuspids would be nearer together than they would if the teeth were arranged in the arc of a large circle. I decided the distance between the points of the cuspids should be the next measurement, which I shall call 'C.' These two measurements would indicate the width of the arch. The only measurement now necessary was to determine the length or depth from

front to back along the median line. It is obvious that in a live subject, or on a model, it would be impossible to locate a fixed point at the back of the mouth, so this was overcome by measuring from the buccal groove of the first molar to the median line. This measurement I shall call 'B.' This line B, being the hypotenuse of a right angle triangle, answers every purpose for determining the depth of the arch, as once this line is known the length of the median line is easily determined.

"The first set of measurements was taken from the arches of five subjects, in all of whom the teeth were in normal occlusion. I might mention the fact that at the beginning of this work it was my intention to measure jaws in normal occlusions, excluding all others. I soon saw, however, that I was excluding some valuable material which might prove to be more interesting than cases of normal occlusions, all of which were natural arches, never having undergone orthodontic treatment. I was quite startled to find that the ratio of these three lines which I have already mentioned was practically uniform throughout five cases. They were as follows:

A	B	C
56	40	36
60	42	38
59	41	37
56	40	35
54	38	34

Taking the average of these measurements and reducing them to the lowest ratio without fractions, we have—

A	B	C
14	10	9

"As all of these first cases were beautiful examples of occlusion, I concluded there must be something significant in these strikingly similar measurements, and at once determined to see if Nature were playing a trick or if this were her method of constructing natural dentures. I thought at the time that living subjects were necessary so I secured access to some manufacturing establishments and began to systematically measure arches of employees. My first group consisting of 50 individuals as shown here with the average ratio. I selected only those which were free from marked irregularity. Little attention was paid to any arches that were out of alignment or showed arrested development. I soon learned that the percentage of arches suitable for measuring would be very low, so I began to look elsewhere. I visited the Museum of Natural History in New York City, and made measurements of skulls of about 50 of the native North American Indians, many of which were over five hundred years old. While many teeth were missing in most of the skulls, fortunately I found quite a number with the molars and cuspids present. Because of the loss of incisors I am able to show only measurements A and C. You will

be interested to know that while making these measurements at the Museum, I was very fortunate in meeting Dr. Clark Wissler, director of the Department of Anthropology. I laid what material I had before him and expressed the opinion that there was not the variability of shapes in the arches that was generally believed. I wish to quote his exact words as he replied, for I was so impressed that I wrote them down at the time: "There is no anatomical part in animals so uniform as dentition. Even between primitives and man there is a striking likeness in the shape of the jaw. Teeth make the arch, the species variability is so small in the ratio type that it requires careful measuring to detect difference in shape."

Another investigator* whose observations coincide with the findings of Dr. Williams, says:

"In an article published in the *Dental Cosmos* for November, 1917, I derived the relationship which exists between the dimensions of teeth and the dimensions of the arch. From the data, for which I am greatly indebted to Dr. Percy N. Williams, of New York, I showed that in the upper arch there are five points which lie on the circumference of a circle, the center of which is midway between the two first molars on a line joining their buccal grooves. These five points are the buccal grooves of the two first molars, the tips of the two canines and the point between the central incisors on the median line. This relation is so rigid in a normally developed arch that the values which I calculated correspond within one or two millimeters with Dr. Williams' measurements. Fifty-four arches were taken at random and in about 30 per cent the calculated and measured values differed by only a fraction of a millimeter. In about 40 per cent, the variations were two millimeters or less, and in the remaining 30 per cent, the differences in the majority of cases were not higher than four millimeters in the width of the arch. These figures are very significant for even these small differences are reduced when the errors in measurements are accounted for."

The same author further states: "If we consider that the ratio and temperamental differences find their expression in the form and the relative sizes in the teeth, we can readily understand how the outline of the arch is influenced by such differences. The position of the canine determines whether an arch is considered relatively wide or narrow and the location of the cuspid is dependent upon the relative mesiodistal dimensions of the crowns of the anterior and posterior teeth. If the anterior teeth are too large in comparison with the posteriors, the cuspids are pushed farther away from the median line along the anterior curve, and the arch will appear to be wide. If, on the other hand, the anteriors are too narrow the arch will have a narrow appearance.

*Alexander Sved

"I also admit that a certain degree of curvature may seem to be present in the bicuspid region and this can be more clearly seen on photographic plates. Here I wish to emphasize that the buccal cusps and not the buccal surfaces of the posterior teeth are placed along a straight line. A line touching the buccal surfaces of the posterior teeth is a graceful curve which may be pronounced especially in the bicuspid region. The fact that in a normal arch the six anterior teeth lie along the circumference of a circle whose diameter is the distance between the buccal grooves of the first molars and that the buccal cusps of the anterior teeth are on a straight line will be true for all arches regardless of type.

"All this is clearly shown in the illustration which represents typical arch outlines for the so-called four basal temperaments. It may be noted that the arches of the bilious and nervous temperaments are unsymmetrical, that the left side is approximately normal in each case. The sanguine and lymphatic arches are very nearly normal. The diagrammatic outlines are drawn slightly larger than the proper size, for the sake of clearness. The writer selected these illustrations from a standard text-book. They were not originally intended to demonstrate these points, and it is hoped that the reader will be the more forcibly impressed with the facts."

These two investigators seem to be agreed upon the question of what constitutes normal arch form and the fact that they have based their conclusions upon the results of systematically acquired information makes them worthy of serious consideration. It is also of interest to note that in its main features such an arch will comply with the requirements laid down by the anthropologist who says that, "under ordinary conditions of the skull and jaws, a normal dental arch is the arch of the normal set of teeth. Unless otherwise interfered with, the arch is what the teeth have made of it." It is quite easy to understand how arches entirely fulfilling the requirements laid down by Williams and Sved might differ somewhat in appearance, for no two arches could be exactly alike unless the teeth were exactly alike.

This is an important point to consider, for usually when any definite plan of arch form is discussed, the average dentist immediately has a mental vision of a stereotyped form of arch without any latitude for variability. This, however, would not be true of arches designed according to the before mentioned requirements, for if the anterior teeth are large in proportion to the posteriors, the cuspids would be arranged farther away from the median line along the anterior curve and the arch would have a broad appearance, while if the anterior teeth are narrow in comparison with the posterior the arch would have a narrower appearance.

As stated before, the six anterior teeth lie on the arc of a circle, the center of which lies midway between the buccal grooves of the first

permanent molars. As a matter of fact this arc does not include the entire tooth substance of the six anteriors, but extends from the point of the cuspid on the other side. The mesial side of the cuspid takes the curve of the anterior teeth, while the distal portion of the cuspid takes the line of the bicuspid. In relation to the cusps of the bicuspid, this line would be a straight line which would extend from the point of the cuspid to the crest of the mesio-buccal cusp of the first molar, where the line again bends to pass in a straight line over the disto-buccal cusp of the first molar and buccal cusps of the second molar. While it might appear that the arch line from the anterior curve forms two sharp angles, one at the cuspid and another at the buccal cusps of the first molar, this is not really the case, for when the curvature of the buccal surface of the cuspid and the bell or contour of the cusps of the bicuspid and molars are taken into consideration it will be seen that a gentle curve is described.

It is interesting to note that Professor Gysi in considering the problems of articulation has described arch outlines which conform very closely to those described by Williams and Sved (Fig. 17). While he does not state definitely what the width should be between the molars in relation to the arc of the anterior curve, he does make the following statements: "The arches have the form of a parabolic curve. The incisors and canines of both arches form part of the arc of a circle. * * *

The distal cutting edges of the canines of both upper and lower arches should point in the direction of the molars, the necks of these teeth only being prominent, allowing the bicuspid to be placed so that they are only slightly visible from the front.

"Two straight lines touching the buccal surfaces of the bicuspid should touch the mesial corner of the first molars and the distal half of the canines. The intersecting point of these lines should be at the same distance from the incisors as the incisors are from a line drawn across the base of the arch." (Gysi—the Problem of Articulation—Chapter 6, Cosmos, Volume LII, No. 3.)

These arches differ rather conspicuously from the ideal arch described by Dr. Bonwill, in that the anterior teeth lie upon a smaller circle and there is less width between the molars. It will be recalled that six anterior teeth in such an arch lie on the arc of a circle, the radius of which is determined by the combined widths of the central, lateral and cuspid. The arch line after leaving the circle formed by the anterior teeth passes over the buccal cusps of the bicuspid and molars. These teeth, therefore, would be in a straight line running backward from the cuspid in accordance with a geometric plan. This principle, which was originally intended as a guide in setting up artificial teeth, has been adapted to orthodontia by Dr. C. A. Hawley.

Some very interesting work along the line of arch predetermination

has been done by Dr. W. H. Gilpatric, whose idea of the normal arch differs somewhat from any of those thus far presented. Upon comparing his conception of it with those I have already described it will be found to be a compromise in width between the arches designed by Williams and Sved and the Bonwill arch. Like the other arches the anterior teeth lie upon the arc of a circle and the arches are parabolic in form. It is interesting to note the process by which Dr. Gilpatric arrived at his conclusion. Like Williams and Sved he was convinced that the form of the arch must depend upon the amount of the tooth substance within it. With this idea in mind, he selected "Trubyte" teeth whose tooth substance was equivalent to that found in natural arches of various sizes. These he set up in an anatomical articulator and arranged them according to his conception of what constitutes arch form. He then subjected these teeth to all the various movements of occlusion and modified the shape of the arches until all such movements were possible. After the work on each arch containing a definite amount of tooth substance was completed, he submitted the result to Dr. Beckford, Professor of Prosthetic Dentistry at the Harvard Dental School, who approved of his findings. Notwithstanding the fact that his conception of the arch does not coincide with that of Williams and Sved, Gysi, Bonwill or Hawley, the work he has done has been so thoroughly done that it is deserving of commendation and serious consideration. He has analyzed arches which vary in tooth substance from 78 m.m. to 101 m.m. for the upper arch measuring from buccal to buccal groove of the first molars, and the corresponding tooth substance for the lower arches which he found varied from 8 to 12 m.m. with the uppers. From these surveys he has produced a set of charts showing the survey of all of these articles. An interesting article outlining his work was recently published in the *International Journal of Orthodontia*.

A civil engineer interested in some of the problems of orthodontia once made the statement that orthodontia must outgrow the use of indeterminate appliances, and borrow from engineering the practice of laying out on paper what they propose to do before they try to do it. He supplemented this remark by saying that until such a plan was adopted orthodontic treatment would continue to be purely experimental—an art based on experience.

Whenever any attempt has been made to bring analytical mechanics and mathematics into orthodontic treatment, the objection has often been raised that these exact sciences are contra-indicated, as they do not aid in the interpretation of biological phenomena.

Such an objection, however, should hardly be taken too literally, for notwithstanding the fact that they are biological factors involved in the movement of teeth which are not governed by mathematics or mechanics, we nevertheless realize that mechanical forces applied

scientifically and correctly (which is possible in the hands of the one who understands them) will not act conversely to biological laws, and indeed, if so applied, will make more easy the solution of these problems.

Whenever orthodontic treatment is contemplated for a given case, the operator usually gives careful thought to the character of the appliances which are to move the teeth, and usually has in mind a more or less accurate idea of the extent of tooth movement required. As it is his wish to place every tooth in its correct relationship with the line of occlusion, would it not be logical to determine before tooth movements begun what the line of occlusion should be? Certainly if every operator would do this, cases could be handled more intelligently and the various teeth moved into whatever positions were necessary, with a minimum loss of time or false movements.

If such a plan were universally followed, it would unquestionably have a tendency to shorten the active period of treatment, which would mean much to the comfort and welfare of our patients, because work carefully planned and systematically carried out would of necessity require less time than work accomplished under any other plan.

THE HAWLEY METHOD OF ARCH PREDETERMINATION.

Unquestionably, Dr. Hawley appreciated these points and realized their necessity, and to him is due the credit of making the first attempt at predetermining arch form. As almost everyone is familiar with this method it will not be described in detail at this time.

The Hawley method has been the subject of considerable criticism, not only from dental engineers, but orthodontists as well, who have objected to it on various grounds. Notwithstanding this criticism, the author feels that great credit is due Dr. Hawley for the spirit in which he introduced this method, and he ventures the opinion that had it been universally adopted at the time it was introduced, more satisfactory results would have been accomplished by orthodontists generally than have resulted from the practice followed by operators to create arch form in accordance with individual ideas of what it should be. Dr. Hawley did not make extravagant claims for this method, but merely suggested it as a guide in diagnosis and treatment.

THE STANTON METHOD OF ARCH PREDETERMINATION.

The question of arch predetermination has received a decided stimulus from the efforts of Dr. F. L. Stanton, whose researches in this subject have extended over a number of years. In his earlier efforts, he attempted to apply engineering principles to orthodontia, but was not satisfied with the results, owing to the fact that such a method required so much labor on the part of an engineer that it was impractical. He therefore discarded this method, and in co-operation with a civil engineer, devised a new method which was mechanical and made possible through an instrument for arch determination which

they have called the oclusograph. According to the writer's conception of it, Dr. Stanton's method is founded upon the assumption that the form of the arch varies according to the amount of tooth substance contained within it. He, therefore, measures from perfect plaster models the greatest mesio-distal diameters of the teeth, and then relies upon his oclusograph to determine the arch outline in the following way. This instrument is supplied with a series of links corresponding to the number of teeth present in a perfect arch, these links varying in length to correspond with the various mesio-distal diameters of the teeth they represent. These are placed in series when a given arch is to be analyzed, the links used corresponding exactly in size with the teeth they represent. Thus two series of links are arranged, one for the upper teeth, and one for the lower, the two series fixed to each other in such a relation that the teeth will be in perfect occlusion. In order to accomplish this, the distance from the buccal cusps to the center of the fossa on the occlusal surface of the teeth is measured in the molar and bicuspid region so that the correct overbite can be selected. The upper and lower series of links are clamped into position, the two crossbars being used to obtain symmetry of the arches.

The idea involved in attaching together the two sets of links representing the upper and lower teeth is to determine the form of the arches, as the two are modified until a correct occlusal relationship is established between them.

Not only does Dr. Stanton believe that the form of arch varies according to the amount of the tooth substance within it, but he says, in speaking of the form of the arch, that "the whole arch depends on the interrelation of the sizes of all of the teeth, all dimensions of the teeth, and all parts and forms of them. If you should have in two cases, the same teeth, the only exceptions being in the two incisors, and they should only vary two millimeters, the entire arch would vary. The smallest change in any tooth produces a material change in the form."

Manifestly, it would be unjust to the method and to its author to comment upon it favorably or unfavorably without being in possession of all the facts concerning it; therefore, the writer must refer those interested to the various articles already published regarding it, so that they may draw their own conclusions.

THE WILLIAMS METHOD OF ARCH PREDETERMINATION.

This method is based on the hypothesis that in the normal arch there are five points which lie upon the circumference of a circle, the center of which is midway between the two first molars on a line joining their buccal grooves. These five points are the buccal grooves of the first molars, the tips of the canines, and the point between the central incisors on the median line. Since three points on the anterior curve fall upon the circumference of a circle, the curve of the anterior teeth are considered to be an arc of a circle.

Following out this hypothesis, Dr. Williams' associate, Dr. Sved, has worked out a mathematical formula, by the use of which the dimensions of the arches can be calculated from the measured mesio-distal diameters of the teeth. As the writer has already dwelt at some length upon the findings of Williams and Sved, they will not be considered further at this time.

THE GILPATRIC METHOD OF ARCH PREDETERMINATION.

Like the methods already described, the Gilpatric method is founded upon the assumption that the form of the arch varies according to the amount of tooth substance contained within it.

After analyzing arches which varied in tooth substance from 78 m.m. to 101 m.m. for the upper arch, measuring from the buccal groove of one first molar to the buccal groove of the other first molar, and the corresponding tooth substance for the lower arch, which he found varied with the upper from 8 m.m. to 12 m.m., he has from his analyses produced a set of charts showing the dimensions of the arches varying between the extremes mentioned.

As stated previously, in order to arrive at a definite idea of the arches of a given tooth substance, Dr. Gilpatric duplicated the natural teeth with Trubyte artificial teeth, which he placed upon an anatomical articulator, subjecting them to all the various movements of occlusion, modifying the shape of the arch until all such movements were possible.

When this point had been reached, each arch was surveyed so that the arch form could be recorded, and from these records a set of charts has been produced which Dr. Gilpatric has called orthodontographic charts.

Fears have often been expressed and objections raised to injecting into dentistry any mathematical or mechanical method for predetermining the shape and size of dental arches. One of the chief objections offered is that such a plan, if adopted, would eliminate the exercise of artistic judgment in our work. If the dental profession was filled with artists, this objection might be considered logical, but as stated before, an examination of the mouths of the majority who wear full upper and lower dentures and of those who have had their mouths subjected to the vagaries of hit or miss orthodontia, bears eloquent testimony to the fact that almost any plan founded upon normal anatomical principles as well as on recognized principles in art would be far more safe for the profession to follow.

It is safe to say that the majority of patients who have undergone orthodontic treatment have not received the maximum benefit possible, owing to the fact that the operators have tried to establish arch form in accordance with their own set ideas of what the patient needed. A close analysis of the majority of cases of malocclusion shows the need of expansion in the lateral half of the arches. Instead of carrying

this expansion to the needed degree, the average operator will push the anterior teeth forward and create a long narrow arch which is, in the majority of cases, both incorrect anatomically and artistically. The laity have commenced to realize this, and orthodontists are often being asked by solicitous parents who are considering orthodontic treatment for their children, "Doctor, will this make my child look too mouthy?" This shows that parents have noticed the mutilating effect of arches created without any definite idea of what constitutes normal arch form and which in reality are created only with the idea of getting all the teeth in the mouth arranged in a concentric line.

The author is convinced that if those who are interested in establishing normal arch form would adapt as a guide in their work any plan of arch determination which is based upon the amount of tooth substance contained within a given arch, and upon recognized anatomical principles, they would render far greater services to their patients than is possible to him who depends upon his "eagle eye" to guide him on his way.

(The foregoing excerpt is taken from an article by Dr. J. D. McCoy read before the Pacific Coast Society of Orthodontists and published in full in October Pacific Dental Gazette.—Editor.)

Nova Scotia Dental Association

REPORTED BY DR. WARREN C. OXNER, SECRETARY.

THE 29th Annual Meeting of this association was held in the Dental Department of Dalhousie University in the evening of July 14th, 1919.

The President, Dr. Ronnon, read his address, which was a masterly review of important Dental events, during the past year.

The Executive Committee reported that in view of the fact that a Dental Post Graduate Course was to be held immediately following the close of this convention, it was decided that the session be confined strictly to business. The annual reports, however, were unusually interesting. Following are the officers elected for the ensuing year:

President	.....Dr. Gordon Hennigar, Halifax
1st Vice-President	.....Dr. H. S. Tolson, Halifax
2nd Vice-President	.....Dr. C. S. McArthur, Truro
Secretary	.....Dr. W. C. Oxner, Halifax

Dr. F. W. Dobson, of Halifax, was made a member of the Executive Committee, and Drs. R. H. Woodbury, and J. H. Rice, of Halifax, were appointed Auditors.

Three members were elected to the Dental Board, Drs. F. W. Ryan, Frank Woodbury and W. C. Oxner.

Dr. Frank Woodbury, our representative to the Dominion Dental Council, read his report, which was adopted, as was also a resolution re membership in the C.D.A.

Dr. Geo. K. Thomson read the following:

REPORT ON COMMITTEE ON DENTAL EDUCATION OF THE PUBLIC

Halifax, N.S., July 14, 1919.

To the Dental Association of Nova Scotia:

Mr. President and Gentlemen:

The following is a report of your Committee for the past year:

Six lectures on "Oral Hygiene" including tooth brush drill and instructions with regard to first aid dental treatment in the Public Schools, were delivered to the students of Normal College, by the Professor of "Oral Hygiene" of the Dental Faculty of Dalhousie University. The subject "Oral Hygiene" has been added to the curriculum of the Normal College and a course of lectures will be given each year.

Several meetings of your Committee have been held during the year and interviews held with members of the Council of Public Instruction, Superintendent of Education, Provincial Health Officers, and Massachusetts Relief Committee, and the School Board of Halifax. These officials realize the importance of educating the public and providing Dental Services for the school children and the poor and promised their co-operation and assistance and granted \$300.00 for Dental education in the schools, which has been placed in the Provincial Estimates for 1918-19.

Arrangements have been made for special lectures by members of the Dental profession throughout the province, purchase of charts and slides and first aid Dental equipment for schools. Dental services in County Health Clinics to be established under the Public Health Act, additional Dental services in Halifax schools, establishment of Dental Surgery by the Massachusetts Relief Committee and appointment of representative of Dental profession on that Committee.

Negotiations have begun with the Halifax School Board with a view to provision of Dental services for the poor school children by the Dental College, one chair to be devoted to this purpose.

DR. RITCHIE'S MEMO.

During the school year the teeth of all the children in Grade 1, 2 and 3, of the Public Schools of Halifax were carefully examined and the results are now being tabulated for publication. The work of looking after the School Clinic has increased to such an extent that it was found necessary to add another half day per week and Dr. Stultz was appointed to take the extra period. It is the intention of the Medical and Dental Committee of the School Board to gradually

increase the time devoted to Dental work in the schools until eventually the full time of one practitioner was occupied.

The Dental Surgery at the Halifax Dispensary has been a great boon to the poor of Halifax. Several hundred mouths have already been put in a healthy condition, much to the benefit of the patients. The Halifax Dispensary bears the entire expense incurred by this.

Your Committee recommended:

1st. The appointment by this association, of a permanent Committee to be called "The Oral Hygiene Education Committee."

2nd. The appointment of a member of the profession in each town to educate the public, encourage the purchase of first aid equipment, and teaching of Oral Hygiene in the schools. This work to be carried on under the direction of the Oral Hygiene Educational Committee.

GEO. K. THOMSON, Chairman.

FRANK WOODBURY

S. J. RITCHIE, Secretary.

F. M. RYAN

K. W. WOODBURY.

This report was adopted and the same committee appointed as a permanent Oral Hygiene Educational Committee.

The Report of the Dental Board was read by the Secretary Registrar, Dr. G. K. Thomson.

The summary of the report is as follows:

No. of names on register.....	176
No. added during the year.....	4
No. passing Board exams.....	5
No. failed in exams.....	1

Several cases of illegal practice were dealt with successfully.

At the last session of the Nova Scotia Legislature the following bills were introduced:

No. 175—An act to register Victor S. Primrose, D.D.S.

No. 125—An act to register Walter Kennedy, D.D.S.

These were withdrawn after having passed the Lower House.

No. 192—An act to amend the Dental Act which was promoted by the Dental Board, was passed and has become law.

Be it enacted by the Governor, Council and Assembly, as follows:

1. Section 18 of Chapter 105 of the Revised Statutes, 1900, as enacted by Section 3 of Chapter 22 of the Acts of 1911, is amended by adding thereto the following sub-section:

(6.) Where a person who is a graduate of a Dental College recognized by the Board which requires less than four years of thirty months' attendance has for one or more years

(a) been engaged in the practice of dentistry in Canada, or

(b) served as a commissioned officer in the Canadian Army Dental Corps during the war, such person may upon filing such certificates and declarations as the Board may require be eligible for examination in all respects as though he had complied with the provisions of sub-section one hereof in respect of studentship.

No. 174—An act to amend the Dental Act was passed and has become law.

Be it enacted by the Governor, Council and Assembly as follows:

Section 24 of Chapter 105 of the Revised Statutes, 1900, "The Dental Act" is hereby amended by substituting therefor:

(24.) Subject to the exceptions hereinafter made, no person shall practise Dentistry in any of its several branches in Nova Scotia unless his name is registered in the Dental Registry, and unless he has received from such Board a license to practise provided, however, this section shall not apply to, or be construed to extend to any paid assistant not registered under this Chapter, employed by any registered dentist or Dental Surgeon in his office; but this proviso shall not be construed to permit any such assistant to act outside the office of his employer, nor shall such assistant be employed in any additional office or offices, or place or places of business conducted by such dentist or dental surgeon, unless the same is in charge of a dentist duly qualified and registered under this act.

2. Said Act as further amended by Chapter 22, Acts of 1911, is further amended by substituting for section 6 of said Chapter 22 the following section:

(6.) No action shall be commenced under said Act after two years from the date of the offence or cause of action.

This latter bill was introduced by Mr. Chisholm, M.P., and defended in the House by Dr. J. D. Mahar of the Boston Dental Parlours, and J. J. Power, Esq. A strenuous effort was made to defeat the bill, but it was passed and is now the law.

RECOMMENDATIONS.

1. That the annual dues be \$3.00 for the ensuing year.
2. That the Board be authorized to act for the Association between meetings in all matters concerning the D.D.C. and the C.D.A.
3. That the sum of \$400.00 be granted to the Faculty of Dentistry of Dalhousie University.

The report of the Treasurer showed a balance on hand of \$626.63. Outstanding accounts receivable, approximately \$1,000.00.

At the Annual Meeting of the Provincial Dental Board the following were elected:

PresidentDr. F. M. Ryan
 Vice-PresidentDr. Frank Woodbury
 Secretary-RegistrarDr. Geo. K. Thomson

Votes of thanks were passed to the University for the kindness in permitting use of their building and to the Executive Committee for bringing the Post Graduate Course to a successful issue.

It was moved and seconded that this association register its strong disapproval of the pernicious legislation enacted in Bill No. 174, by the Provincial Legislature, during its last session.

After the induction of the president elect, Dr. Hennigar, to the chair, the meeting adjourned.

REPORT OF DEAN WOODBURY OF FACULTY OF DENTISTRY OF DALHOUSIE UNIVERSITY.

Dalhousie University, in common with all of the Educational Institutions in Canada, suffered severely during the period of the War, in attendance, income and sacrifice.

Mr. W. J. Cameron, a first year Dental Student of 1914-15, has made the supreme sacrifice on the battle field. Others have been wounded. Several of our graduates have been overseas and acquitted themselves with credit.

Notwithstanding the War the attendance has been increasing. This year four men and one young lady received their diplomas.

Laboratories—The capacity of our laboratories is being doubled this year. Accommodation is being made for 50 students, and we may be compelled to enlarge still more. Our halls could have been filled had we lowered our standards, but this, Dalhousie will never do. Her standards must be met.

An X-Ray Machine of the latest type has been installed for use in the infirmary. Additional lantern slides and technic devices have been added to illustrate the latest methods.

The Library and Reading Room are supplied with the current Medical and Dental Journals. The Library is growing in an important way. Files of journals are being completed and bound, and new works of reference are being secured. The College has subscribed to the Dental Index, by which any article in any journal may be found at once.

The Museum is taking very definite shape. A system of classification has been adopted whereby any specimen may be found in its proper class and the name of donor and a history attached. This will be of great scientific value to the Profession.

A Research Laboratory has been established and some work is being carried on which we believe will be of great interest to the Profession. Dalhousie will be one of the centres for Dental Research in Canada. To Drs. Ryan and Ritchie is due great credit

for untiring faithfulness in the development of the Library, Research and Museum.

It is our desire to fulfil the true functions of a University Faculty and beside the work of educating the individual student create an educational centre from which beneficent influences will radiate to the whole profession and public. We are proud to be associated with the profession in promoting the Post Graduate School, which opens tomorrow. The University looks upon the Faculty of Dentistry as a permanent institution. It is of your creation. The resolutions passed by this Association in 1906 and 1907 and the legislation you secured made the school possible. As the years pass, and this school becomes one of the great ones of the continent, this group of 100 men who had the vision, and have persistently made money grants for its promotion, will be looked upon as benefactors. The teaching staff and management have been proud to each do their "bit" to bring the vision of those days to a realization.

POST GRADUATE COURSE IN DENTISTRY.

Beginning Tuesday, July the 15th, an intensive Post-Graduate Course in Operative and Prosthetic Dentistry was conducted in the Dental Department of Dalhousie University for a period of four days.

Dr. M. L. Rhein, of New York, conducted a course in his well known "Root Canal Procedure." The class operating on extracted teeth, opening up root canals with Sodium and Potassium, so as to obtain access to the periapical region. Filling the canals through the apex, and encapsulating the root ends.

As Dr. Rhein was demonstrating and explaining the action of Kalium-Vatrium, in opening and cleansing the canals, he was asked by one of the class if he had ever used "Purine" for that purpose. The Doctor remarked that he had not heard of it before coming here, but understood it was a product of the Dalhousie Dental Research Laboratory and if it will do all it is claimed it will be a valuable acquisition.

Members of the Research Committee present announced the substance to be "Chloric Acid." The mystifying name of "Purine" had been given it by an English Chemical Company, who used it for a purifying agent for some of their products.

Its very remarkable action in cleansing and opening up root canals and facilitating the removal of pieces of broken broaches, etc., forcibly impressed the Committee. Samples were given to some of the Faculty for chemical applications and very favorable reports have been received.

Dr. Rhein and many members of the class were given samples and their verdict is awaited with much interest.

Dr. Geo. H. Wilson, of Cleveland, gave a course in Modern

Impression Methods, Philosophy and Demonstrations, Methods for Bite and Articulation, compared Retention, Full and Partial, and Vulcanization. Full Upper and Lower Dentures were constructed for a practical case, and in addition, impressions taken for the most difficult case which could be procured. Both courses were conducted in a most praiseworthy and efficient manner. The class, although not quite as large as had been hoped for, was intensely interested and very enthusiastic over the instruction received.

A feature of the course was an address and film given by Dr. Rhein in the Red Triangle Hut. Dr. Rhein, a man of the first prominence in the Dental profession in the United States, who is actively identified in propaganda there, with regard to Mouth Hygiene in the schools, which has been immeasurably helpful and beneficent, delivered a striking lecture on "Mouth Hygiene," illustrated with a remarkable moving picture showing the different methods of brushing the teeth by children in one of the schools of the city of New York, which was accompanied by the report of the Principal of the school to the effect that since the introduction of the drill the increase in efficiency of the children had been such that the standard was the highest in the history of the school.

The expressions of the child in the picture, who was having the tooth filled, clearly indicated all absence of fear, and Dr. Rhein stated that this method of filling the teeth of children was the ideal one, for precisely the reason that not one cares to show fear in the presence of others, and the best results can therefore be gotten. The children take the treatment quite as a matter of course. Twenty more clinics have been added to the eight already in operation.

The Doctor stated that the presence in every school of a Dental Clinic would mean a saving to New York city of more than \$2,000,000,000 per year. The increased efficiency of the young student enabling him to pass his exams readily and not remain for two years, or more, in the one grade. Such is the effect of a healthy mouth upon the whole child.

The lecture was a most valuable one. Speaking this morning to "The Mail," Dr. Rhein was much interested to hear of the introduction, in this city, of additional Dental Clinics.

Time was also found for the social side. On Thursday the 16th, the instructors and class were guests of the Rotary Club, through the kindness of Dean Woodbury, who is a member of the club, and presided as chairman on that occasion. Both Drs. Wilson and Rhein, replying to the toast "To Our Guests" in a very happy vein.

On Thursday evening a dinner was given in honor of the instructors by the class, at the "Tally-Ho." Dr. Charles Faulkner was in the chair and besides the guests of honor there were present, Lieut.-Governor Grant and Mayor J. S. Parker. A short toast

list was enjoyed. It began with the King, then the President of the United States, which was followed by remarks by the Lieut. Governor. His Honor extended a hearty welcome to the visitors and hoped the school would be continued for another year, and indefinitely in the future. Mayor Parker added his expressions of welcome to the distinguished Americans who had come to Halifax for the course, and offered to do anything possible to make their visit still more pleasant.

President A. S. MacKenzie, of Dalhousie, spoke of the splendid citizenship, patriotism and broadmindedness exemplified in the membership of the Medical and Dental professions and attributed this in no small measure that they had been willing to spend their time in teaching and training others to succeed them. Being not only Practitioners, but also Teachers, they benefited themselves and Halifaxians as well. It was therefore with peculiar satisfaction that he saw the Dental School broadening out. The work of men like Drs. Wilson and Rhein who were willing to help others as well as those in their own particular localities, was a pleasant thing to contemplate. It was altruistic spirit that could not but be admired. The function of the University was discussed and their work as at present conducted defended. Universities were subject to change in accordance with changing conditions, but if new work was to be done as was contended in some quarters, new institutions should be created to do it. He joined in the welcome to the two gentlemen who had come to Halifax and who had done such admirable work.

Dr. W. C. Oxner, proposed the health of our guests, Drs. Rhein and Wilson, which was honored enthusiastically, the company joining in singing "For They Are Jolly Good Fellows." They were men, he said with national reputation in their own lines, and under them the course had become an assured success.

Dr. Rhein was the first to respond. He had enjoyed his visit to Halifax, a city which had long excited his interest and doubly so from the great events that had taken place in recent years. He saw a future of wonderful business activity for it. He closed with an expression of thanks for the pleasant reception that had been given him and his colleague. Dr. Wilson said he had been glad to come to Halifax for two reasons, one was the beautiful story of Evangeline that centred in this province, and the other because of Nova Scotia's splendid deposits of gypsum, the best on the American continent. A good deposit had been found in Utah, but it had not proved equal to that from Nova Scotia.

"Will Ye No Come Back Again?" was sung and then came a speech from Dr. F. W. Ryan, of Halifax, who conveyed the thanks of the dental men to all who had helped to make the Post Graduate Course a success. He mentioned the visitors, whose energy had been

notable and had kept the men here hard at work staying abreast with them; the President of Dalhousie, the Y.M.C.A., the Maritime Dental Supply Co., the officers of the Executive Committee, and the Press. Dr. Ryan said he spoke on behalf of his fellow students in the Dental Course.

The course was brought to a close on Friday afternoon. That evening the Halifax members furnished motors for a ride, in and about the city, after which all were guests at the Waegwoltic Club, where a most enjoyable supper was served.

Those who attended the Post Graduate School held in connection with the Annual Meeting, were: Drs. F. W. Ryan, W. C. Oxner, Chudleigh, Dobson, Toson, R. H. Woodbury, Rice, S. J. Ritchie, Frank Woodbury, A. W. Faulkner, MacDonald, Conish, Thomson, Karl Woodbury, W. W. Woodbury, and W. H. H. Beckwith, of Halifax; Dr. F. W. Stevens, Dartmouth, N.S.; Dr. Richmond, Sydney, N.S.; Dr. H. S. Snow, Sackville, N.B.; Dr. F. E. Roche, Wolfville, N.S.; Dr. Clough, Inverness, N.S.; Dr. W. M. Nicholis, Amherst, N.S.; Dr. McLean, Sydney Mines, N.S.; Dr. H. W. Burchell, North Sydney, N.S.; Dr. O'Brien, Amherst, N.S.; Dr. Ronan, Antigonish, N.S.; Dr. Loomer, Stellarton, N.S.; Dr. C. F. McArthur, Truro, N.S.

“The Higher and Better Education of the Dental Student”

THE *Journal of the American Medical Association* publishes in its issue for September 13, 1919, an article on dental education by Dr. Eugene S. Talbot. This article, which bears the title of “The Higher and Better Education of the Dental Student,” was the chairman’s address read before the Section on Stomatology of the American Medical Association at the annual meeting held in Atlantic City, N. J., last June. Dr. Talbot has been for more than a quarter of a century an ardent champion of a thorough medical education as the *sine qua non* of dental proficiency, and in his criticisms of dental education and the institutions in which it is available he has freely given of his views as to what the education of the dentist should include. He relates that at the beginning of his career as a dentist he soon realized that if he was to become a successful practitioner he must know more of pathology than was obtained in the dental school. To obtain that knowledge the medical school was the only way open, and consequently the education leading to the degree in medicine was the goal to be attained by the dentist desirous of equipping himself in a manner that would enable him to best cope with the problems in his own special field. The opinion which Dr. Talbot held then as to the manner of educating dentists and the field

to be covered by this education is identical to the views which he holds today, when he advocates that the dentist should be a stomatologist—a physician with dentistry as his specialty, if he is to reach the level of professionalism.

Insofar as a medical foundation for the dentist is concerned we are in full accord with the views of Dr. Talbot. The training of dental students should include all the fundamentals of general medicine and of all the specialties which emanate from it; and everything Dr. Talbot asks of dentistry must of necessity be in agreement with the views on dental education as held by those who have a correct appreciation of the tremendous possibilities of dentistry when practiced from the standpoints of general and local health conditions. We are not in agreement with him, however, on the method of securing at the present time that foundational education; for while the medical school was in years past the only available source for obtaining it, such is by no means the case at the present time when dental schools are graduating men and women trained in the fundamentals of medicine to the same extent for which Dr. Talbot pleads, and all of it taught from beginning to end in the dental school.

Dr. Talbot argues that "the stomatologist with his medical education is on an equal footing with the men practising in every other department of the healing art, and is, therefore, freely consulted in the most difficult and obscure etiologic symptoms of disease in which the mouth, jaws and teeth may possibly be a factor." If the stomatologist is on an equal footing with the men practicing in other departments of the healing art it is certainly not because he can append two letters of the alphabet to his name, a privilege not accorded to dentists, but for the reason that he possesses the knowledge that enables him to co-operate with physicians, surgeons and specialists on the basis of mutuality of interests. It is certainly not just because he is a physician, for dentists there are, many of them if you please, who notwithstanding their medical degree fail to reflect the light of their knowledge any farther than that of the average dentist; in fact, as a class dentists holding the M.D. degree, who entered the dental schools after completing the medical course, are in dental matters the inferiors of the dentist educated exclusively within the boundaries of the dental school. It is therefore on a basis of educational attainments that professional equality is established as between physicians, surgeons, dentists, ophthalmologists and even stomatologists; and whether the dentist holds the M.D. degree or not is not the deciding factor in favor or against his being the peer of the physician or stomatologist. The argument that in order to be able to intelligently co-operate with the physician, the dentist must be an M.D. primarily and a D.D.S. secondarily is an exploded theory, a relic of medical ultra-conservatism. And while we are on the subject of ultra-conservatism in medi-

cal education let us quote the following from the address under discussion:

"It may be of interest to the members present to know that in the thirty-nine years of its existence (the Section on Stomatology of the A. M. A.), this section has not received a single paper on the subject of the mechanics of dentistry. All papers presented and read before the section have been on the subject of pathology or on some subject of interest to both physicians and stomatologists."

In other words, the stomatologist is not interested in any mechanical procedure connected with either operative or prosthetic restorations. Of the great strides that have been made in these two important departments of dentistry the Section on Stomatology of the American Medical Association has taken no cognizance whatsoever; and yet, it is claimed that the stomatologist is the superior of the medically and dentally educated practitioner. Is it possible, we ask, to have a clear comprehension of the pathology and treatment of diseases of the teeth, their supporting structures—alveoli, gingivae and gums—of the measures to be instituted for the prevention of the most widespread of all diseases, caries and gingival infections, without a knowledge of the "mechanics of dentistry," that is to say, operative and prosthetic dentistry? Is it because of the influence of the Section on Stomatology of the American Medical Association against subjects of so much importance to the people everywhere that the majority of physicians display so much ignorance of matters in the domain of dentistry and advise their patients in regard to their dental ills in a manner frequently conducive to evil, rather than beneficial results. While operative and prosthetic restorations have resulted in the past and are at present responsible for a goodly share of pathologic manifestations in the mouth and in portions of the body, the kind of operative and prosthetic procedures—"mechanics of dentistry"—which are based upon sound physiologic principles are not producing "more disease than any other cause," as claimed by Dr. Talbot. It is the "mechanics of dentistry" in vogue where the sound principles of the technical phases of dentistry are ignored or have not been taken knowledge of in the "last thirty-nine years" which has induced perhaps more disease than any other cause. To claim that modern dentistry is producing more disease than any other cause as claimed by Dr. Talbot is as incorrect and as far removed from the truth as it would be to claim that modern medicine is responsible for all deaths from smallpox and diphtheria before and since the discovery of cow-pox vaccine and anti-diphtheritic serum, respectively.

Because prominence is given in dental schools to the restorative phases of dentistry Dr. Talbot tells us that the present system of dental education can not make a professional man out of the dental student "even if the course should be extended to six or eight years." In the

properly conducted schools it is true that prominence is given to prosthetic and operative procedures, but not any more than it is to pathology, in order to impress upon the student the role played by these departments of dentistry in the prophylactics of dental disease and in the repair of the damages wrought by dental disease, in such a way as to produce lasting beneficial results.

The wholesale condemnation of the present system of dental education is not justified by existing conditions; and such an article as the one under discussion plainly tells the story of an old implanted notion concerning dental institutions, based on assumptions, vagaries, and mental wanderings, but indeed not on facts as revealed by a careful survey of present methods of dental education. A comparison of the achievements of stomatology and of dentistry would be enlightening in this connection.—*Editorial, Pacific Dental Gazette.*

London and Elgin Dental Society

THE regular monthly meeting of the London and Elgin Dental Society was held at the Tecumseh House, London, on Saturday evening, Oct. 11th, with the President, Dr. Colon Smith, in the chair.

Among other communications was a letter from Dr. Conboy, of Toronto, regarding the Dental Survey of the school children of the province. It was decided to ask the School Inspector to divide the county into districts allotting a certain portion to each member for examination.

Dr. S. M. Kennedy reported that progress was being made with the Dental Clinic at Victoria Hospital, but that it was being held up somewhat on account of equipment.

Dr. Clappison, of Hamilton, gave a very interesting paper upon "Peridontoclasia" which brought a very enjoyable evening to a close.

S. A. MOORE,
Secretary.

PLATE POLISHING.—Metal plates will take on a very high lustre when a little aqua ammonia is used in mixing the chalk instead of water. Vulcanite will take on a mirror polish if the finishing is done by the use of tin oxide made into a paste with glycerine. In either case a clean buff should be chosen and kept exclusively for this purpose.—*Dental Record.*

Personal Sketches of Canadian Dentists Who Served in the War

THE part that Canadian Dentistry has played in the world war is, in the aggregate, the personal experiences and worthy efforts of Canadian Dentists who served in the Canadian Army Dental Corps or other branch of the service.

Dentistry would like to know who these men are, and we urge upon every member of the profession, who enlisted in the C.E.F., to send to Oral Health, immediately upon discharge from service, information concerning rank, date of graduation and name of college, date of enlistment, date of discharge, unit, and on character of service.

Every man should consider it as a duty to his profession to assist, in so far as he is able, in completing the dental record of the war. We appreciate the feeling of reluctance which all the men possess, when asked to speak of the service they have rendered. However, this very commendable diffidence should not be permitted to interfere in any way with supplying the information requested, to the end that a fairly complete history may be secured of Canadian Dental practitioners who served in the war.

Oral Health plans to publish one or more of these "Personal Sketches" every month and we trust they may not only prove of great interest, but will be of inestimable value when Dentistry's part in the great war comes to be fully recorded.

—Editor.

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JAMES H. REID, CAPTAIN.



DR. Reid has resumed civilian dental practice at 75 Bloor St. East, Toronto.

Graduated Royal College Dental Surgeons, May, 1916. Enlisted in C.E.F. March 4th, 1916. Date of discharge, June, 1919. Unit, C.A.D.C.

Dental officer on duty at Queen's Canadian Military Hospital and Canadian Hospital Etchinghill, Shorncliffe, also seven months on duty in charge of Oral Pathology clinic at Bramshot camp.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

MOUNTING DENTAL FILMS.

THERE are many devices on the market for mounting dental X-ray films, but few of them are as economical as that suggested by Dr. E. B. Knerr of Kansas City.* His method is substantially as follows: At each corner of the film-negative a small area of the emulsion is scraped away with a knife or chisel. To each of these scraped surfaces a minute drop of celluloid cement is applied and the film immediately cemented to the smooth surface of a strip of frosted celluloid backing, pressing the corners down for a few seconds in order to facilitate attachment to the cemented corners. By using the fingers for this, sufficient warmth is imparted to hasten the setting of the cement.

The cementing material is easily prepared by dissolving discarded films in acetone and diluting to a syrupy consistency by the addition of more of the solvent. This solution is then filtered through cotton and about one-tenth volume of 98 per cent alcohol is added. This acts as a retarder to the setting. As the solvents used in this solution are very volatile, it will be necessary to keep the mixture in a well stoppered bottle. It may be thinned as required by the addition of more acetone.

Celluloid backing suitable for the purpose may be purchased in large sheets and cut to any desired size. It is a good plan to allow a margin sufficiently large to accommodate some descriptive matter.

INTENSIFYING THE DENTAL X-RAY FILM.

SOMETIMES we hear the statement made that a good operator with a poor machine will produce better dental pictures than a poor potographer with the best machine. In many cases this may be entirely correct. No matter how pleased we are with our present results we should be ever on the alert to perfect our technique with a view to attaining the very best that our equipment will produce. Many dentists are satisfied if they become proficient in handling

*International Journal of Orthodontia, January, 1919.

the X-ray machine and leave the more important part of the work, i.e., the developing, to an assistant. With commercial photography the reverse is the case. Any amateur may handle an expensive camera equipped with most costly lens, but the finished picture will be the result mainly of the expert who develops the film. In this department an unskilled workman will spoil the work and no blame could be attached to the camera. In dental X-ray work little skill is required in making the exposure. It is true that a picture taken at a wrong angle will be distorted and not present the anatomical relations correctly, but even this difficulty is being overcome mechanically in the latest and most improved types of machines.

With a view to helping dentists in the new and important department of dental and oral radiography, The International Journal of Orthodontia published in the August issue an exceedingly interesting paper by Lehman Wendell, B.S., D.D.S., in which many of the common errors of developing films are taken up. A careful perusal of Dr. Wendell's paper will prove very helpful to all dental radiographers. The essayist pays particular attention to two methods of developing photographic plates, i.e., the "tray, or visual inspection, method," and the "tank or stand method." There is a third method mentioned, "the factorial method," but as this is giving way rapidly to the "tank method," little reference is made thereto. With the tray or visual inspection method, the worker watches the film as it develops and determines when the work is complete simply by its appearance. Dr. Wendell points out that it is a curious fact that this method is followed by both classes of workers—the most advanced and the least advanced. He claims that although it appears to be the simplest it is in reality the most difficult process for this reason: "To master it requires first of all a thorough knowledge of photography and secondly years of practical application. The worker who follows these methods places the exposed plate in the developing dish, and flows the developer over it, or in the case of the small dental films, the tray is filled with the solution and the films submerged in it. From time to time the plate is removed from the dish and an attempt made to look through it by the light of the red lamp, and to form a judgment as to how far development has proceeded. This sounds like simplicity itself, and so it is when you know how to do it, but until you do, it is the reverse. You will find that considerable experience is needed before you can with certainty decide that a negative is or is not fully developed. The negative is practically opaque before it goes through the fixing bath, and even if it were examined in broad daylight it would be difficult to judge the density."

It is a good thing to point out errors but it is a better thing to suggest a remedy. Dr. Wendell does both for us. In his opinion the most glaring mistake with the tray method is that little or no heed is

given to the temperature of the solutions. If a developer is used which is either too cold or too warm, a negative will be produced apparently quite correct when viewed before the red light, but will prove quite incomplete in detail when finished. Citing a specific case, Dr. Wendell says: "Three plates developed at varying temperatures, (50, 65 and 80 degrees F.) can be developed to a point where the opacity will appear to be identical when viewed before the red light, but when these same plates have been fixed, washed and dried, it will be found that only the plate which has been developed at 65 degrees F. is perfect, the other two being inferior as regards brilliancy, detail and gradation." Owing to the unsatisfactory nature of tray development, Dr. Wendell does not recommend its adoption. Where used, however, its success is likely only if the developing process is carried out in accordance with a definite time and temperature schedule. The best working temperature is 65 degrees F. and the time of development from five to seven minutes. The kind of developer used is a factor in determining the time limit.

There is one method for developing dental films whereby the worker, though unskilled in photography, may produce uniform results. This is the "tank" or "stand" method. Of this method it can be said that the radiographer is compelled to know the temperature of the developer in order that he may know when development should be stopped. Nothing is left to chance. Our essayist points out that this process is based upon the action of a developer of a given strength, for a given length of time, and at a given temperature. It has been a common opinion of most photographic workers that the tank method can take care of normally exposed plates only and that under and over exposures must necessarily come out of the tank under and over developed as the case may be. Dr. Wendell points out that this idea is erroneous and for this reason: "When an under-exposed plate is placed in the developer the image builds up very slowly. The novice is apt to prolong the development for an immoderately long time, hoping to bring out the missing detail, but he forgets that he can not bring out what is not there, or what the light has not impressed on the plate. All he does is to add density to the parts that do not put in an appearance, so that an under-exposed plate that has been forced in the developer shows contrast, but lacks detail. In the case of an over-exposed plate what is the result? The image flashes up quickly and the whole plate darkens rapidly. The inexperienced worker is apt to remove the plate from the developer too soon, with the result that only the superficial layer of the emulsion has been acted upon, and on fixing he will find the plate very thin and without contrast, and almost useless. Now what would happen if under, over, and normally exposed plates were developed at the same time in a tank? The under-exposed plate would be thin, not too contrasty, and would have all the detail possible. The over-

exposed plate would be dense, but full of detail and gradation. The normally exposed plate would, of course, be normal in every respect. We may then formulate a rule: all plates should be developed for the same length of time, regardless of exposure." If dental radiographers were professional photographers, then perhaps the tank method might be dispensed with, but in view of the fact that most of us have had limited experience in this work, some uniform method appears to be imperative, hence the need of the tank process.

Unfortunately for us, Dr. Wendell, owing to the limited space allotted him, was unable to go into details regarding the question of fixation of films. He has, however, very generously offered some suggestions regarding the intensification of films. He says: "Negatives which show detail, but are not dense enough, can be intensified in the following solution:

"No. 1.—Bichloride of mercury, 200 grains, bromide of potassium, 200 grains; water, 10 ounces. No. 2.—Sulphite of soda, half ounce; water, 4 ounces.

"After the negative is well fixed and thoroughly washed, immerse it in No. 1 until it has become thoroughly whitened, and after rinsing carefully, place it in No. 2, leaving it there until full density has been attained.

"Negatives which are too dense all over, due to over-exposure, or to over-exposure and over-development, should be reduced with Farmer's reducer, as follows:

"A.—Water, 16 ounces, hyposulphate of soda, 1 ounce. B.—Water, 16 ounces; red prussiate of potassium, 1 ounce.

"(As solution B is affected by light, the bottle containing it should be of amber color or wrapped in opaque paper.)

"Mix for immediate use: A.—8 ounces. B. 1 ounce. Use in subdued daylight.

"The negative can be transferred to this solution direct from the fixing bath without rinsing. The action is very rapid and must be watched closely. To avoid streaks, always rinse the negative before holding it up for examination. When sufficient reduction has taken place, wash the negative thoroughly in running water."

Editor's Note.—The foregoing formulae were submitted to local dental radiographers, who report that the results obtained were highly satisfactory. Try them.



Home and School

*Devoted to the interests of Dental Health in
the Homes and Schools of the Community*

This Department is Edited by
F. J. CONBOY, D.D.S., Toronto
Provincial Dental Officer, Department of Education, Ontario

THE dental survey of the school children of Ontario will commence as soon as the schools re-open after the mid-summer vacation. Statistics prove that when the children have their teeth inspected, and the card indicating the number of defects is sent to the home, more than sixty per cent of the parents provide the necessary dental treatment; when teachers and nurses do the necessary follow-up work, this percentage is materially increased. It will not be possible to reach all the children in the unorganized districts of the Province by the plan we have adopted, as the dentists in these districts could not be expected to give the time necessary to accomplish this work without fee; we must reach these children by some other method at a later date, nevertheless, we are convinced that as a result of this work the large majority of the children of the Province will receive the dental care they so greatly need.

Some short time ago the department sent out a letter to all the dentists of the Province, with the exception of those who practised in districts where there already was a permanent system of dental inspection, and asked for assistance and advice in this great and worthy undertaking of making a dental survey of all the children of Ontario. The majority of the dentists responded offering to assist, and giving the department very valuable information in regard to the problem as it affected their particular districts. After a very close study of this information and careful and mature consideration of the whole problem, we have decided upon the following plan:

This department will send to each school inspector a complete list of the members of the profession practising in his inspectorate, he will then get in touch with the dentists either individually or collectively and arrange with them the time and manner of inspection, the allotment of schools and the matter of transportation. We will send to each school inspector, the required number of tongue depressors, parents' notification cards, report blanks, etc., and he will see that they

are at the school when the dentist arrives. The teacher or nurse will assist by filling in the card, seeing that it is sent to the home and doing the necessary follow-up work. The information gained by the inspection will be published in the local papers and also compiled by this department; it is hoped that when these facts are published the public will be awakened and will realize the necessity of establishing a permanent system of dental inspection.

We are aware of the fact that for various reasons some of the dentists will not be able to assist in this great enterprise, and we are very anxious that no member of the profession should feel that in sending the complete list we are endeavoring to force him to perform a task he feels he cannot conveniently arrange to do.

Letters from men who are willing to assist, but who have been away and therefore could not reply to our communication at an earlier date, are coming in every day and will continue to come for the next few weeks, but the lists must be prepared immediately and as we are very anxious to have the help and co-operation of every dentist in the Province, we are sending the Inspector the complete list and hoping that the members of the profession will see the matter from our viewpoint and appreciate our difficulties.

THE WORK COMMENCES.

On October 22nd a large number of the Ontario dentists started in to make a dental survey of the school children of the Province. This inspection was delayed for nearly two weeks because it was found impossible to get the necessary supplies; these supplies were ordered some months ago but owing to the illness of the official who has charge of this work and the large amount of material that had to be printed in connection with the election, parents' notification cards and report blanks could not be provided. The Department of Education was in no way responsible, as Dr. Waugh did everything in his power to hurry the work up; this department is extremely sorry that this unavoidable delay put some of the dentists to considerable inconvenience and is deeply grateful to these men for their patient forbearance.

More than three hundred of our dentists volunteered to give a reasonable amount of their time to assist in this great undertaking; they are doing the work without fee, the department paying the travelling expenses only. The Minister of Education and the citizens at large appreciate the public-spirited and generous action of the dentists, and their kind sacrifice of time and energy will mean much in the improvement of the physical and mental condition of our boys and girls.

Dentistry is to be congratulated upon having within its numbers so many broad-minded and public-spirited men, as this earnest and

practical concern for the welfare of the public could not be duplicated in any other profession.

* * * *

THE TRAVELLING DENTAL SURGEON.

THE Observer describes the arrival of a school dental officer in the following terms: It had not occurred to me that a dental surgery could be packed into the side-car of a motor bicycle and carried round the country, nor had I dreamed that such things were done. One is apt to regard a dentist as a person who is permanently attached to a brass plate, who occupies a house where various alarming and substantial mechanisms are clamped to the floor. Even experience of Army dentists who set up their clinics in tents at the base camps of our various expeditionary forces had not led me to regard dentistry as one of the roving professions. It was the more surprising, therefore, to learn from the owner of the very muddy motor-bicycle which came to rest in the garage of the chief inn of the village that the boxes in his side-car contained a complete dental outfit. On the next morning I saw the boxes unpacked. One flat case was opened, and there came out various bits of metal and little cushions which were transformed in about forty seconds into a complete and indubitable dental chair. More bits of metal from another case were whisked into the form of that terrifying drill which all right-minded people detest and fear. Other cases emptied themselves on to a table till there was a horrible array of the various instruments which usually live in trays and tall cases; not a detail of the familiar outfit was lacking. The dentist took up a card, opened the door, and called a name. A small, determined boy marched in and was greeted cheerily and set up on the travelling throne. He opened his mouth and a swift examination was made. "Here you are," said the dentist to me. "See that molar?" He pointed to a tooth far back in the small mouth. The centre of it was discoloured. "He can't have had that tooth more than three months," the dentist went on, "and yet, as you see, it is decaying already. I shall clean it for him and put in a stopping, and it is quite likely that it will be all right when I come round next year. But if it was left to go on as it is going now for another year there would be no hope of saving it." I closed the door hurriedly and went about my business, thinking as I went of a certain big marquee which I found in Malta some two years ago. There three dentists and a crowd of assistants were busy day after day, week after week, repairing the mouths of various thousands of members of the Army who would never have needed any treatment and who might have been spared months of pain and misery if there had been a travelling dentist to come and look at them when they were small children.



A Visit to Saskatchewan and Alberta

WHEN the officers of the Saskatchewan Dental Association invited me to attend their annual meeting at Saskatoon, I was delighted with the honor. When the Edmonton men wrote me asking me to go on to Edmonton, I said "Yes." A night letter from Calgary was also answered in the affirmative, and thus I was to "swing the circle" and do what little good I could.

When I landed at Saskatoon I was met by a delegation from the Association and soon made acquainted with a typical Western welcome. Some of the men I had seen, some I had not seen, but it appeared to make no difference—in a few minutes I felt as if I had known them all my life. There were Dr. Switzer, the President of the society; Dr. Campbell, the Secretary, and Dr. Winthrope, the chairman of the executive—three of a kind and a very excellent kind.

I found the spirit of this wondrous Western country well typified by the members of the Saskatchewan Society. In the part of the Province through which I traveled from Winnipeg to Saskatoon, the crops were almost a total failure through a protracted dry period, and as many of the dentists are interested, directly or indirectly, in farming, I looked for very few men to attend the meeting. But I was astonished to find gathering at Saskatoon a very representative body of men coming from all parts of the province. Distances are very great out in that country, and some of those men came hundreds of miles to attend the meeting. There was a larger percentage of dentists in attendance than one would ever find in the Eastern Provinces or States where distances are much shorter and facilities altogether easier. And they were there for a purpose. They attended strictly to the business of the sessions from beginning to end, and not a moment was lost. The Saskatoon men, as hosts, devoted themselves whole-heartedly to the welfare and comfort of their guests, and everyone was looked after with solicitous care. The

papers and discussions by the members showed that they were well up in the essentials of modern dentistry, and that they had made themselves familiar with dental literature. When they worked, they worked, and when they played, they played. They took us in cars around the city, and out to the Provincial Experimental Farm, where we were shown some of the possibilities of Saskatchewan in the way of farm produce and live stock. The farm is in connection with the University of Saskatchewan, and the splendid group of buildings comprising the different departments of the University would be a credit to any Province of the Dominion.

I shall have something to say a little later about that wonderful thing—the Spirit of the West—a thing that must be reckoned with in any consideration of the Prairie Provinces.

At the banquet on the evening of the first day of the meeting I heard some splendid music, and some excellent speeches. Dr. Campbell was Toastmaster—and a good one too. There were songs by Drs. Harwood and Salisbury, instrumental music by Mrs. Salisbury—I wish you could have heard her play, it was worth traveling a long distance—and speeches by Drs. Chant, Whittaker, (of Edmonton), Switzer, Moyer—our old friend Sylvester Moyer, formerly of Ontario,—Dean Ling, of the University; Major Cowan, Dr. Harwood, Col. Munroe, of the Medical profession, Mr. H. McConnell, of the legal profession; Dr. Wilson—who covered himself with glory proposing “The Ladies,”—Capt. Carson, and others. Seldom have I had a more enjoyable evening or listened to better talent. Where all were so excellent it would be difficult to particularize, but I hope I may be pardoned for saying a word about two of the speakers to whom I listened with especial pleasure, not only because of the excellence of their speeches, but because of my long acquaintance with them. Dr. Moyer is always charming when he is on the floor. He is a natural-born speaker and story-teller. He lost his health in Ontario, went out West and recovered it, and has kept it ever since. Not only this, but he has retained his wit, his wisdom, and his perennial youthfulness of spirits. I would travel many miles to hear Sylvester Moyer make a speech, and I would take all my friends with me if I could. Then there was Major Cowan—what dentist in the Dominion does not know Dr. W. D. Cowan? No one, I imagine. Dr. Cowan has been Mayor of Regina, and is now member of the Federal House at Ottawa. He has been a man of affairs in his Province for years and has thereby brought distinction to his chosen profession. It is always a treat to hear him speak, and when he got through with his subject, the C.A.D.C., his hearers were more than ever impressed with the value of this service in the army.

The evening altogether, was a decided success—rendered doubly

so, be it said, by the presence of the ladies. However, bless the ladies—they lend distinction and “class” to every function of this kind where they are present, and a banquet is not a real banquet unless they are in attendance.

The 1919 meeting of the Saskatchewan Dental Association was a most successful one in every way—due wholly to the loyalty and enthusiasm of its members, and the untiring efforts of its officers. Dr. Switzer made an admirable President, Dr. Campbell a most efficient Secretary, and Dr. Winthroe—well, it was said of Dr. Winthroe that he was omnipresent throughout the entire meeting. I have seldom seen such devotion to duty, such unselfish personal sacrifice for the welfare of the whole; and when men of this type have an enterprise in charge, there is no question of its success.

The President for next year is Dr. G. E. H. de Witt, of Regina, and I predict for his administration an even greater success than that attained this year—a mark set well enough up to make the present officers extend themselves. They have my heartiest good wishes for a pleasant and profitable year’s work in their splendid organization—an organization which seems to me to hold promise of taking its place among the most progressive of all the Provincial associations.

I left Saskatchewan with a real live Saskatchewan orchid in my button hole, the gift of Dr. Smith of Saskatoon, who has gained distinction as a cultivator of rare flowers. I also left with the pleasant memories of my sojourn among its citizens. They were so cordial, so appreciative, and so solicitous for my comfort that they made me feel as if I were really one of them. There is a warmth of welcome in the West that is distinctively their own and no man who once experiences it will ever again find himself quite so small a man as he was. It has a broadening influence that expands his ideas, and draws him closer to his fellow-man. Hail to the West!!

I must leave Alberta for another article.

C. H. Johnson.

Universal Habit

Lives there a man who has not said,
“To-morrow I’ll get out of bed
At six o’clock, and get things done
Before the setting of the sun?”
Lives there a man who has not said,
At six a.m., “How good this bed
Does feel,” and snores till after eight,
Then wonders how he slept so Late?

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Vol. IX.

TORONTO, OCTOBER, 1919

No. 10

EDITORIAL

Harold K. Box, of Royal College of Dental Surgeons, Honored at New Orleans

DR. Harold K. Box, Professor of Oral and Dental Pathology, Royal College of Dental Surgeons of Ontario, presented before the National Dental Association, and the American Academy of Periodontology, at the meetings held in New Orleans, 17th to the 24th of October, 1919, papers covering Histological Factors in Periodontia, and the Dento-Cemental Junction, with more particular reference to the Histology and Prognosis.

One section of the Dental Profession has heretofore insisted that all *pulpless* teeth are without exception, *dead* teeth, and generally speaking, the members of the Medical Profession have allied themselves with this group and are recommending the ruthless extraction of all *pulpless* teeth. Upon the other hand there have been many noted Dental Practitioners who have maintained that a *pulpless* tooth is not necessarily a *dead* tooth.

Dr. Box's researches have had the effect of placing this important question upon a more scientific basis. Among many other facts established, Dr. Box has conclusively shown that instead of finding a zone of impervious tissue lying between the cementum and dentine, communication between these two systems does actually occur. It

would appear that not only does the pulp help to nourish the apical cementum, but that there is a flow of plasma from the periapical tissue to and from the dentine, by way of the cementum. This discovery has practical application from the standpoint of tooth nourishment, root sterilization, and focal infection. Certainly, Dr. Box's researches seem to have established beyond peradventure the fact that a *pulpless* tooth need not of necessity be a *dead* tooth. Dr. M. L. Rhein, New York City, is reported to have said in relation to these findings that on account of the attitude of certain branches of both the Medical and Dental Professions, the presentation of this work at this time is both momentous and most opportune.

These papers by Dr. Box represent the result of many years of intensive research work carried on in Toronto, and owing to the tremendous practical benefit accruing to the Dental Profession, the American Academy of Periodontology showed their appreciation by electing Dr. Box the first Fellow of the Academy. The work of Dr. Box on the Histology of the Dental tissues is of such an outstanding character that it has given this research worker international recognition in relation to this particular field.

Pre-Dental Year—Royal College of Dental Surgeons

THE Colleges and Universities throughout the Dominion of Canada uniformly report an abnormal registration of students for session 1919-20. The young manhood of Canada has, during the past five years, been engaged in national and war service. Peace has turned the attention of these young men toward the institutions of higher and technical education. In addition the normal number of civilians have applied for registration.

Upon the regular registration days and during the two weeks following, the Superintendent of the Royal College of Dental Surgeons received applications from 375 men for enrolment in the Freshman Class. This number compares with 432 in Medicine and 380 in Applied Science, University of Toronto.

A conference composed of the President, the available members of the Board, and members of the Faculty, was hurriedly called to determine what limit should be placed upon Freshmen registration, it being impossible to accommodate all the registrants. It was decided that all the enlisted men, numbering 260, should be admitted and that in addition 60 civilians be accepted, making a class of 320.

Owing to the huge number of applicants who could not be admitted to first year Dentistry, the suggestion of a pre-dental year was made and twenty students applied for registration.

This action, in effect, is voluntary enrolment in a five year Dental Course, and the University of Toronto will recognize the pre-dental year as the equivalent of one year in Arts, leading to the Degree of Bachelor of Science. The subjects, arrangements and examinations will be determined by the College and University acting jointly.

Universal Adoption of Metric System

A LEAGUE was recently formed to encourage the adoption of metric units (meter-liter-Gram) throughout the world. The resulting propaganda has brought forth many interesting and powerful arguments in favor of the universal adoption of the metric system.

The Secretary of the U. S. Government Bureau of Standards has pointed out that during the war American manufacturers were forced to use the metric system in the manufacture of guns and other ordnance. Two principal locomotive works were also compelled to use this system, otherwise locomotives could not have been produced from the blue-prints supplied.

Economists and public men have for many years urged the advantages of this simple decimal system of weights and measures. "Doubtless the Anglo-Saxon's aversion to change would be quickly overcome," declares one writer, "were it generally known that our measurement by weights, ounces and quarts, had its origin in Germany." Upon the other hand, it was an Englishman who originated the metric system.

It is also claimed that the exclusive use of the decimal system would create a greater unity among the world's nations, both commercially and socially, and would therefore be a potent means of the continuation of peace. Furthermore, in these days of scientific industrial research it would be of great advantage to adopt a similar system of measurements for both *Science* and *Commerce*.

Medicine and Dentistry Branches of the Same Science

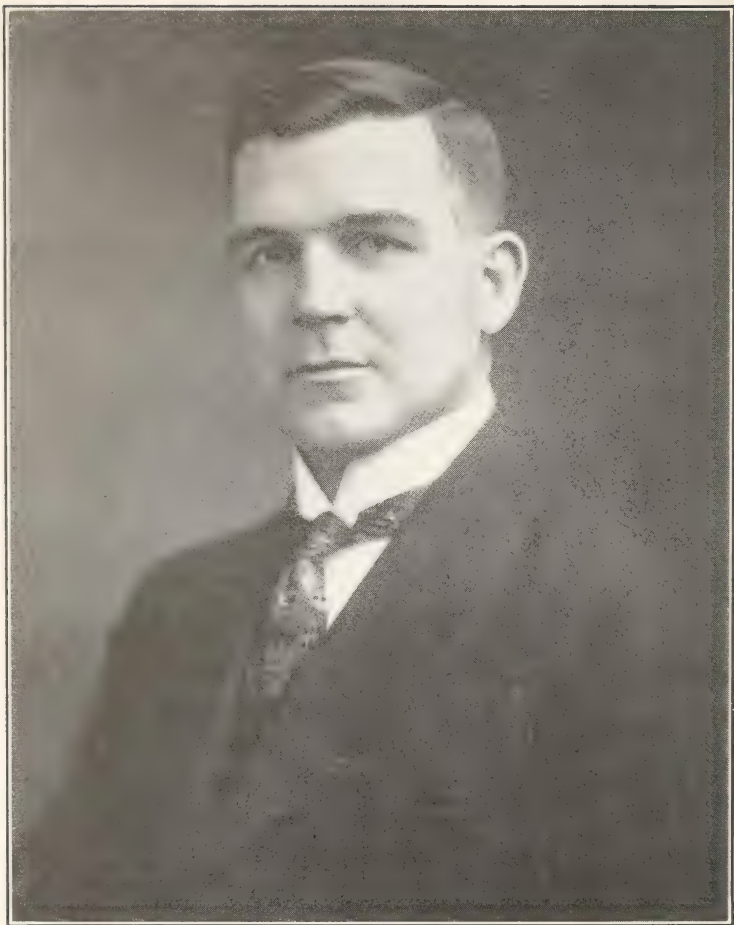
WRITING in the *Commonwealth Dental Review*, Australia, E. Pridham, B.D.S., says:—"We (Dentists) like to regard ourselves as a branch of the medical profession."

Not so! We do, however, regard ourselves as a branch of the Sciences of Health. Medicine and Dentistry are each branches of that great science.

The Teeth

Those cherries fairly do enclose
Of orient pearl a double row,
Which, when her lovely laughter shows,
They look like rosebuds filled with snow.

—La Messa Madrigaleca.



CAPTAIN R. D. THORNTON, C. A. D. C.

*Professor Dental Anatomy, Royal College of Dental Surgeons.
President-elect Toronto Dental Society, 1919-20.*

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, NOVEMBER, 1919

No. 11

Cast Clasp Technique in Removable Bridgework*

BY NORMAN BEVERLY NESBITT, D.M.D.

(Instructor in Casting Technic, Dental Department, Harvard University. Instructor in Cast Clasp Bridgework, Dental Department, Columbia University.)

AFTER a five year trial, the cast clasp used as a means of replacing missing posterior teeth without mutilation of the abutment teeth involved, has become standard. Your essayist deems it important at this time to touch on the following points:

- 1st. For what purpose should the cast clasp be used?
- 2nd. What steps led to the establishment of the author's technique?
- 3rd. Why a working model on which to build the case, is used from start to completion of the bridge.
- 4th. Summary of five years' experience with the use of the cast clasp bridge.

A review of our dental literature for the past eight years shows conclusively that the day for the indiscriminate killing of healthy pulps has passed, never I believe, to return. It shows the dental profession somewhat divided as to the actual menace of a devitalized

*Read before the Toronto Dental Society, Toronto, Ontario, November 3rd, 1919.

Read before the Hamilton Dental Society, Toronto, Ontario, November 4th, 1919.

(Portions of this paper were read before the National Dental Association, New Orleans, October, 1919.)

tooth, but united on the question of pulp conservation. It also shows an awakened interest in correctly constructed partial dentures, with especial attention paid to the clasp as a means of fixture.

That we may have a clear conception of what we are to talk about, let us consider for a moment two removable constructions used to replace missing teeth. These are partial dentures and removable bridges.

There seems to be confusion in the minds of many of our profession as to what constitutes the difference between a partial denture and a removable bridge. When the removable structure is so planned that the saddle receives the burden of the stress, and the abutments are utilized principally for the purpose of retaining the structure, then it should be classed as a partial denture. When the abutments take the burden of the stress regardless of whether or not a saddle is used, then the structure should be classed as a removable bridge, be it made of metal or vulcanite.

The cast clasp as referred to in this paper was devised for an attachment for removable bridge work, and has but a limited use in partial dentures, where usually a clasp of more resiliency is indicated.

When used as an anchorage for removable bridge work, the cast clasp has proved its worth, and used where indicated, *where mutilation of the abutment teeth is not desirable*, cannot be excelled by any known attachment now before the dental profession.

Technique may be defined as the method in which an artist uses his materials to express his mental conceptions. Hence the higher those mental conceptions, the more carefully planned will be the technique elaborated to fulfill those conceptions. A technique planned with the sole idea of producing something, must always fall before the technique of the one whose vision leads him to build a technique that turns vision into actual result.

Many examples to illustrate the foregoing might be given, but one will suffice. It has become an axiom that the perfection of product of the gold inlay worker is in direct ratio to the care he uses in following out the technique employed.

The experimental work done to produce the technique first presented to my profession early in 1915, extended over a two-year period in 1913 and 1914. During that two-year period of experimental work, many ideas and methods were tried and finally discarded. This with the vision ever in mind of ultimately placing before the dental profession a completed technique, scientific, and yet at the same time practical and simple as possible. Of the discarded methods of producing a cast clasp I will mention the following:

(Experiment No. 1.) Adapting casting wax and other wax directly to the abutment teeth in the mouth and attempting to remove the pattern.

(Experiment No. 2.) Adapting base plate and other kinds of wax to the teeth on a plaster model and casting: First, by cutting the teeth off the model, investing the whole mass, and casting. Second, by removing the wax pattern.

(Experiment No. 3.) Painting liquid casting wax on a model of the abutment tooth poured with inlay investment, investing the tooth and pattern and casting. This same method was also tried with variations such as: First, adapting thin casting wax to the tooth and building up the pattern to the desired thickness with other casting wax. Second, adapting a thin pure gold matrix and then building up with casting wax. Third, using a harder refractory material than inlay investment and casting direct to the tooth. Experiment No. 3 with its variations is the popular method followed by those who believe that the present technique is too difficult. If ease of execution had been the only desideratum, our experiments would have ended with experiment No. 3.

Quite satisfactory cast clasps can be produced by the use of all the foregoing methods.

Experiments were then conducted on models prepared with removable teeth, Weinstein's Artificial Stone being first used. This, although far harder than plaster of paris and indispensable in practically all prosthetic operations proved too soft and amalgam was then substituted. These amalgam teeth proved satisfactory and are used at present. Experiments were also tried with the use of horizontal notches cut into the enamel of the buccal and lingual surfaces of the clasped teeth; and with the use of short round headed pins or spuds set into the buccal surfaces of the abutment teeth. These pins engaged corresponding depressions in the buccal arms of the clasps, much in the manner of a glove fastener. As the idea of these devices is to gain additional retention to compensate for a poorly fitting clasp, and as the cast clasp *should* be used with the idea of *avoiding* tooth mutilation, the writer considers their use contraindicated. Indeed, he considers their use in an average case a confession of inability to make a proper fitting cast clasp.

Early experiments showed that it was very difficult in all cases, and almost impossible in some cases to test the proper fit of a cast clasp by trying it on the abutment tooth in the patient's mouth. Therefore some other means of obtaining the correct relations of the clasps to the teeth, other than the customary method of first taking an impression with the clasps fitted to the patient's teeth, had to be devised.

Our technique was developed with the idea of having an unblemished model on which to build the case, take relations of clasps in their *correct* positions, and make final fittings and adjustments; but best of all, it enables us to properly design our clasps, and know that we can get the bridge easily in and out of position when completed.

The technician who destroys his model at any phase of the process is obliged to wait for a trial in the patient's mouth with the result that much tedious blind grinding often has to be done before the piece can be adjusted.

"The practice of every art," says Professor Huxley, "implies a certain knowledge of natural causes and effects; and the improvement of the art depends upon our learning more and more of the properties and powers of natural objects, and discovering how to turn the properties and powers of things and the connections of cause and effect among them to our own advantage." The most practical thing in the world is the most scientific. In fact, nothing becomes really practical until it is put on a scientific basis; that is, until its relation to other facts is known and noted. To be scientific as well as practical a cast clasp should not be a mere inert, bulky ring of metal, but should be resilient to a slight degree; not much heavier than a wrought clasp of 24 gauge (B & S Standard), but most important of all, should grasp the tooth tighter at its ends than at anywhere else. This last named property is obtained by forming under tension a casting wax pattern on a metal tooth. Owing to the shrinkage of the casting wax used (Taggart's) this tension is released when the pattern is chilled and removed from the metal tooth model, causing the two ends of the pattern to draw together slightly. This, with a further contraction of the casting metal, cast in a cool mould, causes the finished clasp to grasp tighter at its ends than at any other point in its circumference. This grip is highly desirable because of the following facts:

Masticating force applied to a clasp type removable bridge tends to move it principally in three directions—gingivally, mesially and distally. Three inclined planes are brought into play in each clasp; one at the occlusal rest, and two at the ends of the clasp arms. The tendency of the bridge to act as a wedge is slightly increased by the inclined planes of the occlusal rests, and these forces must be correctly counterbalanced by a strong resistant grip at the *ends* of the clasp arms or the bridge will fail in time, due to the opening and loosening of the clasps or the shifting mesially and distally of the abutment teeth. Comparatively slight gripping power is required to retain the bridge against all ordinary efforts of mastication, but great strength is required in the clasp arms to keep the abutment teeth from migrating and consequent loosening, and to limit the lateral motion of the piece. Theoretically, the use of the round wire clasp gives the greatest insurance against future disintegration of the abutment teeth, but unfortunately the round wire clasp has not the forenamed properties of the cast clasp. If the round wire clasp had succeeded in cases where the cast clasp has succeeded, the cast clasp would have no excuse for existence. The writer is frankly willing to admit that he has, for twenty years, always used the round wire clasp wherever he could,

but that he cannot now substitute it for the cast clasp where the cast clasp is indicated. He also has had occasion to note, since the cast clasp became popular, its use in many cases of prosthesis where the use of wrought clasps of either wire or sheet metal would have been much better.

The successful prosthodontist must invariably be the one with many methods at his command. No one type of appliance or attachment will fit every case. Depending upon his wise selection and proper application of the many forms of attachments now in use, as well as upon his technical ability, will his work succeed or fail.

Five years' experience with the cast clasp as devised by your essayist has brought out the following points:

That it is a most useful attachment for posterior removable bridges where mutilation of tooth structure is to be avoided.

That it will succeed in bridge cases where other types of clasps have failed.

That it is adaptable to all variations of form of bicuspid and molars, and over 90 per cent. of cuspids.

That it is practically immune to breakage providing a suitable gold alloy is used for casting.

That the abutment teeth and adjacent tissues remain in good condition.

That patients will remove and clean the appliances if properly instructed and due emphasis is placed on the importance of such cleaning.

That the finished clasp is no better than the wax pattern.

That the correct designing of the wax pattern has largely to do with the success of the finished bridge.

That the cast clasp is useful only in a very limited number of cases of partial plates.

That a method, although simple, may not be as easy as it seems.

To those of my profession who were using cast clasps prior to 1913, I have this to offer. It is promptness of execution that puts the value into any idea. The best idea in the world is valueless until put into working shape and used. The technique of the cast clasp was put into working shape in 1914, and has been in use ever since. Your essayist believes with the late Theodore Roosevelt, that every man owes some of his time to the upbuilding of the profession or business to which he belongs. The host of friends of the cast clasp bridge already in the dental profession is proof positive that the writer's experimental time was not spent in vain.

125 Marlborough Street,
Boston, Massachusetts.

Initial Report of the St. Louis Study Club*

ORGANIZED, JANUARY, 1919.

(Dental Study Clubs are too few. Even a comparatively small group of Dentists may accomplish much through organized and systematic study. The following report, from Dental Summary, is passed along to Oral Health readers that the St. Louis Club results may be an inspiration and stimulus to others.—Editor.)

THE following subjects were studied by the members of the club:

- Crown and Bridge Work.
- Vital Tooth Attachments.
- Cavity Preparation and Inlay on Vital Cuspid.
- Three-quarter Cast Gold Crown.
- Bridge with the Occlusal Rest.
- Bridge with Porcelain Root.
- Lingual Bar Partial Denture.

Instructors for this class were: Dr. Malcolm Robb, Dr. E. R. Hart, Dr. Otto J. Fruth, Dr. J. D. White, Dr. L. G. Neuhoff.

Treatment and Filling of Root Canals as advocated by Doctors Howe, Callahan, and Coolidge. Dr. W. A. Chamberlain, Instructor.

Bacteriology. Practical laboratory course in examining, staining, etc., of the principal bacteria found in the mouth. Dr. C. Kelker, Instructor.

At the end of the term, a dinner in honor of the teachers was given by the students. The chairman of each class read a detailed report of the progress made, which was followed by a general discussion. These reports contain a concise description of the technic used in the class work and are considered of sufficient interest to the dental profession for publication.

The classes will take up the work again in September and continue further research work until June, 1920, when we expect to have more supplementary reports for publication.

BACTERIOLOGY*

BY DR. L. R. MAIN, ST. LOUIS, MO.

IN submitting to you a report of the work done in the study classes in "Bacteriology and Its Practical Application in the Office of the Every-Day Busy Dentist," I can scarcely do more than mention, in the time allowed, some of the interesting and instructive ways in

* Read before the St. Louis Society of Dental Science.

which the knowledge thus gained will aid us in meeting the problems of daily practice more intelligently.

A better understanding of mouth infection is the point of mutual interest of the medical and dental professions.

A laboratory course, such as was presented to our study class, is of inestimable value. It contributes to a more thorough understanding and comprehension of primary oral lesions manifested by symptoms in remote parts. For example, in the case of a patient suffering from rheumatism and presenting also an oral infection, a microscopic study of a culture of pathogenic organisms may identify some organism or chain of organisms responsible for this arthritic disturbance.

When a growth of streptococci is obtained from a tooth or socket, we are in a position to suggest to the physician in positive terms the great necessity of ridding the mouth of these virulent organisms, because of their association with such systemic disturbances.

Since even in the mouths of apparently healthy individuals the various oral bacteria are ever present, I do not wish to infer that wherever we find micro-organisms we necessarily find disease. However, where we find symptoms of disease we can often substantiate our suspicion by making cultures or by merely examining microscopically smears obtained from the mouth.

In doubtful root canals, that is canals in which the sterility is not certain, it is possible to aseptically remove some of the dentin along the walls or near the apex of the canal, make a culture, incubate, and endeavor to obtain a growth therefrom. If a growth is obtained it is certain that the canal is not thoroughly sterilized.

This sort of work also gives the dentist an opportunity to do some interesting experimenting along research lines in the treatment of dental lesions.

One might ask to what degree is such information of value to the dentist aside from broadening his mental horizon and enabling him to more intelligently consult with the medical man. To my mind it will give to the dentist who is mentally alert, an opportunity to treat dental lesions more scientifically. He can thus ascertain with what organism he is dealing and practise rational instead of empirical therapeutics, because of his knowledge of certain organisms and conditions that are favorable or unfavorable to their development.

By closely watching the results of certain drugs in a given case where the organisms are known and by comparing these results in similar cases, we are in a better position (with the use of the microscope) to make an intelligent prognosis to the patient.

To my mind such a course will prove beneficial to every practising dentist who is not already familiar with this work.

CHAIRMAN'S REPORT OF THE CROWN AND
BRIDGE CLASS.*

BY DR. MAX FENDLER, ST. LOUIS.

"Study Clubs are the time-keepers of progress."

I DEEM it a privilege to be associated with the Study Club as chairman. The Club stands for a league of progressive, studious men, the type of man that to-day is wedging and hewing his way into the very stone of undeveloped truths, ever seeking the fabric of reason, eager to know the facts and the manner with which to apply them; willing to lend an ear, voice and hand to the unravelling of the intricate problems which, as students, we see on the every-day horizon of professional endeavor.

Not through the keyhole of selfish competition walled off by the air of stagnation, but out into the larger room of light, co-operation and good-fellowship, you have cemented your foundation. A vital foundation, gentlemen, I am sure, that has all the castings of perpendicular lines, strength and a desire to "carry on" to the ultimate rearing of a structure monumental in its purpose.

You have not been tied to a harbor of close-minded content, with the hawsers of yesteryear rusting their usefulness upon the sands of inertia, but out upon the broad seas of open-minded initiative you have chosen your chart. Its study you have tabulated with benefit to yourself and surprise and delight to your instructors.

Study Clubs shake us loose from that feeling of security which we are lulled into by inaction, and lack of study. Constructive criticism is but a stepping-stone to higher and more intelligent proceedings. Act in unison—grasp the rope of progress, it is dangling before us eagerly. Pull all together with a determination and a fixed purpose, with a heart strong and eyes forward to the light. Come along! By attrition go forward—wade in—rub shoulders—get a whack and a knock, it will have a tendency to straighten you up and show you the truth.

Our daily work does not carry with it the starry banner flung to the breeze, the sight of which urges men on to big self-sacrificing deeds. There is no sound of martial music to quicken the step when it becomes heavy with fatigue and sameness. No praise of the multitude to bring the head erect, the pulse and breast beating with a desire to DO—no gentlemen, it is not given for men in our calling to bask in the limelight of public gaze. Our stage setting is made by our own hands; as we ourselves fashion it, so it remains. We do not do the things which call for public acclaim, but as ships that pass in the night, we go on and on with duty and true service as our cargo, and conscience alone as our captain.

* Report of the members of the St. Louis Society of Dental Science.

It is good for us to foster and hold dear the spirit of idealism and sentiment. We should temper our work with true art, to reprint, if possible, nature's handiwork. This is not possible without the mirror of an idealist.

May I not say, the enthusiasm, loyalty and energy you have shown in attention to your task has been a keen enjoyment and incentive to your chairman, a real vital instrument in your hands pointing the way for immediate propaganda among the profession of our city.

PARTIAL DENTURE WITH LINGUAL BAR ATTACHMENT AND OCCLUSAL REST.*

BY DR. LOUIS G. NEUHOFF, ST. LOUIS, MO.

CLINIC Selected: The Restoration of the Lower Right Second Bicuspid and First Molar.

Technic: The various parts of this denture consisted of a swaged saddle, cast lingual bar, clasp, two occlusal rests, re-enforcing rods, and lugs.

The first step in the construction of this denture was obtaining a die and counter-die of the edentulous space, upon which was swaged a saddle of 20k, No. 30-gauge gold. The saddle to lie apron-like over the gums but not encroaching upon moving tissue, and to slightly encircle the approximal teeth but not to be in contact with them. The edges and angles to be trimmed in graceful curves. The lingual and buccal margins to be slightly flaring, thus preventing the tissues from crowding over the edge. This should be pre-determined and provision made before making the die.

The next operation was constructing the lingual bar, which in this case was cast in two sections and soldered together. The metal of choice for this casting was either 10 per cent. platinum-gold or Ney-Oro Elastic. The pattern for the lingual bar was formed upon the original model with saddle in place. Three layers of No. 60 tinfoil was first burnished to the lingual surface of the incisors, and all gum portion embraced within the circumference of the intended lingual bar, which in this case extended from the saddle to the first bicuspid on the opposite side of the mouth. The approximal surface of the just mentioned bicuspid should be well defined by trimming the model before burnishing the foil. The object of the tinfoil was to provide a space between the lingual bar and the tissues to preclude any irritation. The surface of the tinfoil being oiled, the casting wax was fashioned to form the pattern for the lingual bar, which should be oval in form and of about 14 gauge in thickness and 3-16 of an inch in width. The wax over-lapping the saddle about 1/4 inch and lying

*Report of the members of the St. Louis Society of Dental Science.

about $\frac{3}{8}$ inch below the margin of the incisors. At the median line a dove-tail or lap joint was provided for, thus forming the joint for soldering the two sections together. This wax end being oiled, the waxing was continued until opposite the first bicuspid on the left side where the lingual bar is somewhat enlarged, and conforming to the lingual surface of the first bicuspid, encircling it distally into the approximal space, and also mesially with an additional extension over the mesioocclusal angle forming a lug or occlusal rest.

(At this stage of our studies our worthy clinician showed how wax could be made to flow up hill, how heat repelled wax and how cold attracted it. How heating the spatula handlewise of the point enables wax to be applied to a surface in form of a ribbon, a beaded edge or in hemispheres.)

The clasp for the first bicuspid adjacent to the edentulous space was made of 24-gauge clasp gold and encircled the tooth a little more than half the circumference, also being contoured to fit the bulging portion of the tooth but not to come in contact with the saddle unless a short occlusal bite existed. The circular form of the clasp and contour is produced at one operation. Having cut the clasp from a pattern obtained, it is laid flat upon a block of lead, and with a ball-ended instrument placed upon the gold and driven down with hammer blows will tend to coil and contour it to approximately the desired shape which is further completed with pliers. (The knob of the handle of a dental instrument is mentioned as ideal for this). The edges of the clasp are rounded and somewhat beveled toward the tooth. The clasp is attached to the saddle by an upright flattened wire of clasp metal which is bent at right angle over the edge of the clasp and forms an occlusal rest on the distoocclusal angle of the banded bicuspid tooth. The other end of the wire is also bent at right angle, where it is attached to the saddle. A similar occlusal rest is formed for the mesioocclusal angle of the second molar and likewise is soldered to the saddle at the nearest point. The occlusal rests were made of No. 14-gauge clasp wire.

All parts were next assembled upon the original model and waxed together to prevent liability of distortion upon removal therefrom; short sections of common wire were waxed crosswise from one section to the other. The banded bicuspid had to be fractured from the model to facilitate removal, which later on was cemented back. (The sticky wax was composed of three-fourths beeswax and one-fourth rosin.)

This was then invested in plaster and tenax, with no portion of the metal covered with the investment, as this was merely to serve as a soldering block for the parts to rest upon.

The first soldering is to attach the lingual bar together, next applying blowpipe where the bar joins the saddle, then follow by soldering

the clasps and occlusal rests to saddle. The brush flame is played upon the heavier portions first, bringing the blowpipe to a needle flame if the lighter and thinner parts are being overheated, or if the soldering is to be confined to a small area. 20k solder was used throughout.

The denture was now replaced on the original model and any distortions (which usually occur with gold dentures) were corrected.

The saddle was next wired with 24k, No. 18-gauge gold, and this was tacked with 20k solder at several places. Then the vulcanite side of the saddle and wire was coated with Spanish whiting and alcohol as an anti-flux. The denture then being turned upside down, the wired edges were completed with 18k gold solder.

A strengthening bar was soldered from the ridge of saddle diagonally across to where the saddle and lingual bar joined.

Various little lugs for vulcanite attachment were soldered to the surface of saddle.

It is desirable that this denture should fit the model so its removal is only accomplished by a slight tilting and unlocking motion.

The case was removed from the model for vulcanizing and completed the usual way.

REPORT ON THE HOWE METHOD OF TREATING ROOT CANALS WITH AMMONIATED SILVER NITRATE, AS GIVEN TO THE CLASS ON ROOT CANAL TECHNIC OF THE STUDY CLUB*

BY DR. W. H. WELLS, ST. LOUIS, MO.

THE use of ammoniated silver nitrate in the treatment of root canals is a method which not only sterilizes the canal and tooth structure but fixes those shreds of organic material which can not be removed by instrumentation. It is a method which Dr. Howe advocates to be used in all root canals. Those which are freshly devitalized and those which have become septic.

The solutions which Dr. Howe advocates are solution No. 1 and solution No. 2.

Solution No. 1 is made by adding to a saturated solution of silver nitrate, 28 per cent. ammonium hydroxid. The addition of the ammonium hydroxid produces a dark precipitate, which continues to be thrown down until there is an excess of the ammonia; then the solution becomes clear. An excess of ammonia is undesirable, because of its irritating properties; so the solution should be left slightly cloudy. This undissolved silver oxid will settle and the clear solution is used.

Solution No. 2 consists of 25 per cent. formaldehyde.

Flow solution No. 1 into the root canal and allow it to remain

*Report of the members of the St. Louis Society of Dental Science.

three minutes; no pumping or forcing is required, as it has been proven that the solution will flow wherever it is required by means of capillary attraction, osmosis and the affinity the ammoniated silver nitrate has for albumin. The excess of No. 1 solution is removed by means of paper points and No. 2 solution flowed to place and allowed to remain three minutes.

The results of the use of these two solutions is to throw down minute particles of free silver, which impregnates the organic material in the canals and tooth structure and plugs the dentinal tubules.

By repeating the above application three times, minute collateral canals and foramina are sealed with free silver and the canals ready for any canal filling which the operator wants to use.

Discoloration is controlled by plugging the apical part of the canal with paper point, painting the rest of the canal and cavity surface with synthetic varnish, Caulk's cavity lining, or vaseline, after which the paper point is removed and the silver flowed to place.

REPORT ON THE TECHNIC OF THE CALLAHAN AND COOLIDGE METHODS OF FILLING ROOT CANALS, AS GIVEN IN THE CLASS ON ROOT-CANAL TECHNIC OF THE STUDY CLUB.*

BY DR. R. G. SENDKE, ST. LOUIS, MO.

IT is not my endeavor to add anything to what our able instructor, Dr. Chamberlain, to whom we all feel grateful for the trouble he has gone to, to help us solve the many trials of root-canal work, has given us in his lectures, but only to enumerate the various points which he laid down for us in the Callahan and Coolidge methods.

The Callahan Method in brief, is the use of H_2SO_4 in the opening of the canals, and the use of rosin and chloroform as a cementing substance in which a gutta-percha cone is pumped back and forth in the canal until the solution of rosin, gutta percha and chloroform are forced into the tubules and foramina, and a perfect sealing of those openings brought about.

Dr. Callahan's formula for the cementing solution, which is known by his name, calls for 2 oz. of violin rosin and 2 oz. of chloroform. To this may be added a small amount of thymoliodid or iodoform.

The Coolidge method requires that the root canal be opened sufficiently to admit a No. 1 Kerr plugger within two millimeters of the root end. Any root-canal cementing solution is worked into the apical end of the root canal. A No. 1 Kerr plugger carrying a piece of gutta-percha cone attached to its end, is then passed into the canal as far as it will go and the gutta-percha packed to place. It is easy to determine the amount of excess which will be forced through the

* Read before the St. Louis Society of Dental Science.

root end by the fact that the plugger goes within two millimeters of the apex. Small pieces of gutta-percha cones are now packed into the canal until full.

The opening of root canals is the most difficult part of the operation. The canals which are encountered are those which are septic and which have previously received root-canal work; those which are septic but never have received root-canal work and those in freshly-devitalized teeth. Access to the canals and leaving undisturbed the relation between the pulp chamber and canal is essential.

In opening, sterilizing and filling teeth in these three classes, about the same general method is employed. With septic canals which never have received canal work, some gaseous medicament is used, to suppress the aerobic bacteria, before any root-canal work is attempted. The best of these gaseous medicaments is a paste made by grinding up a chlorozene tablet with glycerin. This was first advocated by Dr. Ewing P. Brady. Formocresol may be used.

In teeth where there are septic canals with imperfect fillings, xylol is used to soften the gutta percha and aid in its removal. Xylol is preferable to chloroform because it is less volatile.

Sodium potassium is now used to aid in getting into the canals and in destroying the organic material. This is followed by 40 per cent. sulphuric acid, which neutralizes the alkali and helps to attack both mineral and organic material.

Bicarbonate of sodium is used to neutralize the sulphuric acid and by virtue of its effervescence, carry out the debris. Reaming and enlarging is now done alternately with sulphuric acid and bicarbonate of sodium until the canal is ready to fill.

The following are the steps advocated in the opening and the filling of the root canals.

1. Open pulp chamber.
2. Pass fine, smooth broach in canal.
3. X-ray.
4. Get accurate measurement in millimeters.
5. If picture is accurately taken, tooth in picture will be same size as natural tooth. If broach extends through root end corrections of measurement can be made. If above does not seem accurate, wire can be replaced and another picture taken.
6. H_2SO_4 , 40 per cent. is now used; flow along smooth broach which is worked around in canal, with a circular motion.
7. No. 1 Kerr file, Kerr reamer or XXX fine 20th century barbed file is marked at the proper length and reaming is started. Each time it is twisted in and withdrawn it is wiped on sterile gauze. Canal is reamed with these until end is reached. In withdrawing during the reaming, the instrument is swept over margin of canal each time, which gradually enlarges the orifice, into a funnel shape. The

debris is removed from the instrument by wiping it on a piece of sterile gauze, on which has been poured a little tincture of iodine. Cotton pliers or other such instruments, which have been contaminated quickly may be sterilized by dipping the instrument in tincture of iodine and burning off.

8. No. 2 Kerr file, reamer or XX fine 20th century file.

9. No. 3 Kerr file, reamer or X fine 20th century file.

10. No. 4 Kerr file, reamer or X fine 20th century file.

This is kept up until canal is large enough to fill.

11. Canal is now flooded with saturated solution of bicarbonate of soda, which neutralizes the H_2SO_4 and removes the debris.

12. Dry canal with paper points.

13. Flow in acetone, dry with warm air.

14. Select sterile gutta-percha point which goes nearly to root end and leave in canal.

15. Flow rosin and chloroform in alongside of canal point, then grasp point with cotton pliers and with pumping motion gradually work into canal.

16. Force another gutta-percha point into canal and again pack with canal pluggers, using a large one to compress material in canal, then No. 1, to force gutta-percha against wall. This is continued until canal is packed.

17. Each canal is filled separately within 1 mm. of chamber floor. Canal is cut clean with bur and filled with oxychloride of zinc.

18. This method only fills those canals which are dry and open, according to Callahan.

Text Books recommended are: Duke, *Oral Sepsis*; Raper, *Dental Radiography*.

A BRIDGE.*

BY DR. E. R. HART, ST. LOUIS, MO.

IN these enlightened days when as we all know, focal infection is playing such an important part in systemic disorders, it is not only proper that we, as dentists, should heed the sounded note of warning regarding devitalized teeth and their sequelæ, but necessary that we conserve in every possible case the pulps of these masticating organs.

Dentistry is advancing to the higher planes with such rapidity that one must keep pace with the newer order of things or be relegated to the back-number class; it is either progression or retrogression; we cannot stand still; and with due respect to the newer technic in root-canal work, the promiscuous destruction of pulps in teeth for bridge

* Read before the St. Louis Society of Dental Science, being a report of the Technic of Construction as given to the St. Louis Study Club.

attachments, might well be considered a crime—hence our Study Club. Let me, at this point extend to those gentlemen who so kindly gave their time in imparting knowledge to us, the thanks of the class; I, for one, do appreciate and have benefited by their instruction.

While we have studied various attachments, (all on vital teeth) this report will cover but one style, and then go further and take up the construction of this particular type of bridge.

One of the essentials in all dental operations, is the radiograph. Especially is it so in this type of restoration as it gives us an outline of the pulp chambers in those teeth which we wish to utilize as abutments; assures us as to sufficient supporting process of abutment teeth; shows direction of roots of those teeth which we wish to replace, and conditions surrounding them. Coupled with the radiographic examination is a thorough study of the case, i.e., position and alignment of the teeth, forces of occlusion, examination of soft tissue, and a planning of our work.

ABUTMENT PREPARATION.

This preparation is for attachment known as the three-quarter crown, and is ideal in that it affords a maximum of strength with a minimum of tooth destruction (and pulp irritation) thereby assuring long life to the restoration.

Instruments and materials used are: Safe side discs, both flat and safe inside saucer-shape, mounted carborundum stones, small, knife edge, tapering fissure and straight, cross-cut fissure burs and gingival margin trimmers.

The initial cut is made on the mesial (with flat disc), cutting straight down from incisal or occlusal toward the gingival, and in a direct line from labial or buccal to lingual. This is carried gingivally as far as the particular case demands, and our first cut should give us sufficient extension on buccal or labial for self-cleansing margins and a very slight gingival shoulder. The second cut is made by a slight lingual rotation of the handpiece to carry our preparation onto the mesiolingual angle.

The preparation on distal is made in the same manner, using a safe inside saucer-shaped disc, cutting down through contact point and gaining sufficient clearance for an outward movement of handpiece to obtain our preparation on distolingual angle. The mesial and distal preparation should be parallel or slightly converging toward incisal or occlusal. With a tapering fissure stone the lingual surface is swept backward and forward to connect our mesial and distal preparations, and obtain the slight shoulder. This shoulder should be very slight—one-quarter to one-half millimeter—and I might say right here that its purpose is not for seating our finished casting but merely furnishes a definite line for our margins.

In the anterior teeth, the lingual concavity is swept with small

stones, removing any faults in the tooth surface and to allow for the slight thickness of our finished casting. Retention grooves are cut on mesial and distal, with small cross-cut fissure burs or stones, beginning at the proximo-incisal angle back of the labial enamel plate, and working gingivally until the shoulder is reached; next with a small knife-edge stone, the mesial and distal grooves are connected by a groove linguallly to the incisal edge. (When the incisal edge has been involved by abrasion, attrition or filing, our preparation must be made accordingly.) This gives us a staple form from mesio-gingival angle, across incisal or occlusal to disto-gingival angle, and acts as a guide for seating our finished casting and prevents lingual displacement; this staple form being reinforced by that part of attachment covering lingual surface. In posterior teeth, the preparation is practically the same, except that sufficient enamel is removed from the lingual cusps to allow for the thickness of material in our attachment, and extending into the sulcus is finished to the buccal of our mesiodistal groove against a definite wall.

One point that must be constantly borne in mind is that all grooves in our abutment teeth must parallel each other.

WAXING AND CASTING.

The direct-indirect method is used in this work, as it permits of a perfect view of all margins. Then too, you will find it much easier to carve your wax with the model in your fingers than when it is in a very inaccessible place in the patient's mouth. Nevertheless, a wax impression is made in the mouth by forcing the wax into place and holding with a silk strip while the patient bites on it and exercises lateral motion of the jaws. This gives us our occlusion and contact points.

Select a "Blue Island" band (long) that is slightly oversize for the tooth and with this about two-thirds of the way on the tooth, modeling compound is forced into it and band and compound pressed to place. Maintain pressure until compound can be chilled. It is then removed, invested in plaster, and packed with amalgam. In investing this impression, build the plaster around and beyond the edge of the band so that an excess of amalgam may be packed into it to form a root on the tooth, thereby making it easy to handle. After the amalgam has hardened, break away the plaster investment, warm the compound and remove the die. A thin coating of glycerin is applied to the model and the wax impression placed in position; this is carved, paying careful attention not to destroy contact points, wiped with a small amount of oil of cajuput and cleaned with acetone, invested and cast.

One of the features of the three-quarter crown for bridge attachments is that it necessitates only a minimum of tooth destruction, so to get a maximum of strength one should use an alloyed gold. Dr.

Hart has given us a gold that seems to meet the requirements in the matter of strength and color, (St. Louis Dental Mfg. Co., Hart Gold.)

IMPRESSION.

The abutment pieces, polished, are placed in position in the mouth and an impression taken. For this work we take a full core impression, using modeling compound. In this method, the labial and buccal flange of a deep tray is cut away, and a roll of softened compound is placed along the occlusal and incisal surface of tray and pressed to place in the mouth; chill this, and cut away that compound which worked out buccally and labially, also that between convergent teeth (if any).

The impression is removed, thoroughly chilled and replaced in the mouth; the buccal and labial edges of compound are coated with "Nujol" and a small roll of softened compound is placed in the posterior buccal region; now instruct your patient to whistle, the buccal muscles will press the compound into the interproximal spaces and give us a good sharp impression. Repeat this on opposite side for labial surfaces of anterior teeth; all being thoroughly chilled and removed. The abutment pieces are placed in position in the impression and buccal and labial plates waxed on. Place a carpet tack in each abutment piece, to reinforce the cast, and pour up with "Sump." A full impression is taken of opposing teeth and a cast made in "Spence" compound, Alstone or Weinstein's artificial stone. Articulate and mount on anatomical articulator.

FACING AND ROOT.

Care should be taken in the selection of our facing to get the proper mesiodistal diameter through contact points; and it should be no longer than the crown of tooth which we wish to replace. At the proximo-gingival angles, grind away the shoulder which will reduce the mesiodistal diameter of neck. A backing of 1-500 platinum is placed over pins and turned back at right angles about 3 mm. below, giving us a base upon which to build the root.

In building the root it is well to use porcelain of a darker shade than the gingival color of facing as it will have a more natural appearance in case there is any recession of the gingival tissues or even reflecting through these soft tissues, will match the neighboring teeth and gums. The S. S. White, R. or J. porcelain comes very near to filling the requirements in the majority of cases.

The mix being made rather stiff, the root is built on and shaped with the fingers, quite some oversize and baked to a biscuit.

A good impression and the radiograph gives us knowledge of the direction of the root in the process, which information is necessary in our next step.

With a fine sharp instrument, cut in around the gingival of the tooth to be replaced on the "Sump" cast, being very careful not to destroy the outline of the gum septum. If the instrument is worked in at an angle, it will be quite easy to break out the tooth and still retain the outline of the root. With an oversize round bur, from which the blades (except the two main ones) have been ground off, drill down into the cast, following the direction of root as shown on labial surface of cast and in radiograph; get required depth (about two-thirds length of root) then enlarge to outline.

The biscuited root may now be ground to fit, and any additional changes made in form of facing. Bevel incisal and proximal edges of facing and entire cervical edge of root, using fine stones and plenty of water. When ground to proper size and form, scrub with Dutch Cleanser or any good powder, dry, and glaze.

Place porcelain in cast and wax in position, using the soft black wax; then coat the labial or buccal surfaces of the cast with separating fluid or soap and make a core impression of this surface in soft plaster. This impression acts as a guide in getting the proper relation of teeth and furnishes a backing against which we can get pressure in waxing up the "dummy." The dummies being waxed and carved, the wax and porcelain are separated by inserting the sprue into the wax, and touching the porcelain with sticky wax, and gently teasing apart. Insert carbon points into the pin holes in the wax, invest and cast.

ASSEMBLING AND SOLDERING.

Fit casting to porcelain and thoroughly polish. Replace in cast, align with plaster core impression and wax at contact points with sticky wax. The core may now be removed and the gum portion of cast, cut away from porcelain root to permit of its easy removal, which may be done by touching the porcelain with sticky wax and gently teasing away. Scrape the separating medium from cast, soak in water and add sump to labial or buccal surface. When dry, boil out the sticky wax; a very small piece of fluxed solder and a needle flame from the blowpipe are sufficient to solder the parts at contact points. Since each part was polished before the bridge was assembled, a very little polishing at soldered points is all that is necessary to finish.

Have the patient return, teeth extracted, and fit bridge. If any grinding is needed on porcelain root, this must be reglazed before cementing.

In bridge work of this type, we give the patient a restoration that is esthetic, sanitary, and serviceable; we can more nearly duplicate the tooth that was sacrificed; a properly-fitted porcelain root prevents resorption of the process, thereby maintaining the gingival festoon; the porcelain is, as far as we know, the only material that really is

tolerated by the body tissues and radiographic examination of cases, after several years, have shown a regeneration of tissue to, and surrounding the porcelain root. We have a more natural contour to the lingual surfaces of restored teeth, which aids in mastication, deglutition, and enunciation, and eliminates the pockets found under the old style bridge work.

Bridges, with porcelain-rooted dummies attached to vital teeth have come, not only to stay, but to grow into use by more and more of the better dentists until within a very short time, we can look back at some of our old-style work and wonder "how we got by with it."

Dominion Dental Council of Canada Examination Results, 1919

Medicine and Surgery—Boyd, W. E., Boyd, B. M., Bier, Brown, J. W. E., Clemence, Cox, Chegwin, Crouch, Connors, Dimmick, Dickson, S. R., Dickson, J. H., Flett, Ferguson, Foley, Gillespie, Hotham, Hugill, Hall, Holmes, Johnstone, Laidlaw, McKenzie, A. C. M., McIntyre, Ott, Oke, Poyntz, Pommer, Quigley, Robb, Sawyers, Shortreed, Thomas, Wood, A. D., Wood, B. H.

Anaesthetics—Aitken, Alcombach, Boyd, W. E., Bier, Boyd, D. M., Brown, J. W. E., Clemence, Cox, Chegwin, Carrothers, Crouch, Connors, Conn, Demmock, Dickson, S. R., Dickson, J. H., Dunsmore, Flett, Ferguson, Foley, Gillespie, Hotham, Hugill, Hall, Holmes, Johnstone, Lebbetter, Laidlaw, MacKenzie, A. C. M., McIntyre, Ott, Oke, Pickard, Poyntz, Poag, Quigley, Ross, Robb, Sawyers, Shortreed, Thomas, Vandervoort, Wood, A. D., Wood, H. B.

Physiology and Histology—Adams, Abar, Brownlee, Boyd, W. E., Boyd, B. M., Black, Barnes, L. B., Barnes, A. F., Brown, H. M., Brown, J. W. E., Best, Croft, Corbett, Cameron, Crowe, Crouch, Dickson, S. R., Dinniwell, Elliott, Ferguson, Foley, Finnigan, Falkner, Gunton, Granovsky, Gott, Hyde, Haines, Hoar, Hotham, Hall, Haynes, H. W., Johnstone, McAllister, McCutcheon, Pickard, Poyntz, Quigley, Smart, Steele, Sawyers, Upton, Wessles. Windram.

Materia Medica and Therapeutics—Alcombach, Brownlee, Boyd, Blakely, Benezra, Brown, J. W. E., Croft, Coyst, Clermont, Cox, Crouch, Connors, Conn, Dickson, S. R., Dickson, J. H., Dunsmore, Ferguson, Foley, Fralick, Gunton, Gemeroy, Hillis, Hughes, Hotham, Hugill, Haynes, Johnstone, Morrison, Milne, Morton, McIntyre, McLachlan, McVicar, Pommer, Ross, N. A., Robb, T. I., Snider, Sawyers, Vandervoort, Winthrope, Wood, H. B.

Pathology—Aitken, Hall, Ott, Oke, Pickard, Poyntz.

Operative Dentistry paper — Aitken, Alcomback, Brownlee, Boyd, W. E., Bier, Boyd, D. M., Brown, J. W. E., Clemence, Cox, Chegwin, Carrothers, Crouch, Connors, Conn, Dimmach, Dickson, S. R., Dickson, J. H., Dunsmore, Flett, Ferguson, Foley, Gillespie, Hotham, Hugill, Holmes, Hall, Johnston, Laidlaw, Mackenzie, A. C. M., McIntyre, Ott, Oke, Pickard, Poyntz, Poag, Quigley, Ross, H. A., Robb, T. I., Sawyers, Shortreed, Thomas, Vander voort, Wood, A. D., Wood, H. B.

Orthodontia—Aitken, Alcombach, Boyd, W. E., Bier, Boyd, D. M., Brown, J. W. E., Clemence, Cox, Chegwin, Carrothers, Crouch, Connors, Conn, Dinmach, Dickson, S. R., Dickson, J. H., Dunsmore, R. J., Flett, Ferguson, Foley, Gillespie, Hotham, Hugill, Hall, Holmes, Johnstone, Laidlaw, MacKenzie, A. C. M., McIntyre, Ott, Oke, Pickard, Poyntz, Poag, Quigley, Robb, Sawyers, Shortreed, Thomas, Vandervoort, Wood, A. D., Wood, H. B.

Chemistry—Best, Haines, Morton, Zimmerman.

Bacteriology and Pathology — Alcombach, Brownlee, Boyd, W. E., Boyd, D. M., Blakely, Brown, D. M., Benezra, Brown, J. W. E., Clermont, Clemence, Cox, Crouch, Connors, Conn, Dickson, S. R., Dickson, J. H., Dunsmore, Ferguson, Foley, Gunton, Gemeroy, Gillespie, Hillis, Hughes, Hotham, Hugill, Holmes, Johnstone, Milne, Morgan, McIntyre, Pommer, Poag, Ross, H. A., Robb, T. I., Sawyers, Shortreed, Vandervoort, Wood, A. D., Wood, H. B.

Physics and Chemistry—Adams, Abar, Boyd, W. E., Bier, Boyd, D. M., Clemence, Cox, Chegwin, Crouch, Connors, Dickson, S. R., Dimmiwell, Elliott, Ferguson, Foley, Finnigan, Fralick, Gunton, Granovosky, Gott, Gemeroy, Gillespie, Hyde, Hoar, Hotham, Haynes, Johnston, Lumb, Morrison, MacLachlan, McVicar, McAllister, McCutcheon, Ott, Pickard, Poyntz, Pommer, Quigley, Smart, Steele, Sawyers, Taylor, Upton, Wilson, Windram, Wilson, P. R.

Anatomy—Adams, Abar, Brownlee, Boyd, W. E., Boyd, D. M., Black, Barnes, L. V., Blakely, Barnes, A. F., Brown, H. M., Best, J. H., Benezra, Brown, J. W. E., Croft, Corbett, Cameron, Crowe, Crouch, Dickson, S. R., Dininwell, Elliott, Ferguson, Foley, Finnigan, Granovsky, Gott, Hyde, Hoar, Hotham, Haynes, Johnstone, MacIntosh, McCutcheon, Reed, Steele, Sawyers, Taylor, Upton, Wilson, C. B., Wessels, Windrain, Zimmerman.

Jurisprudence and Ethics—Aitken, Boyd, W. E., Bier, Boyd, D. M., Brown, J. W. E., Clemence, Chegwin, Carrothers, Crouch, Connors, Dimmach, Dickson, S. R., Dickson, J. H., Flett, Ferguson, Foley, Gillespie, Hotham, Hugill, Hall, Holmes, Johnstone, Lib-

better, Laidlaw, MacKenzie, A. C. M., Ott, Oke, Pickard, Poyntz, Poag, Quigley, Sawyers, Shortreed, Thomas, Wood, A. D.

Prosthetic Dentistry and Metallurgy paper—Aitken, Alcombach, Brownlee, Boyd, O. M., Brown, J. W. E., Clemence, Cox, Chegwin, Carrothers, Crouch, Connors, Conn, Demmach, Dickson, J. H., Dickson, S. R., Flett, Ferguson, Foley, Gunton, Gillespie, Hughes, Hotham, Hugill, Hall, Holmes, Johnston, Joynt, MacKenzie, A. C. M., McIntyre, McLachlan, McVicar, Ott, Oke, Pickard, Poyntz, Poag, Quigley, Ross, H. A., Robb, T. I., Sawyers, Shortreed, Thomas, Vandervoort, Winthorpe, Wood, A. D., Wood, D. B.

Clinical Examination.

Prosthetic—

Aitken	Dickson, S. R.	Ott
Alcomback	Dickson, J. H.	Oke
Boyd, W. E.	Flett	Pickard
Bier	Ferguson	Poyntz
Boyd, D. M.	Foley	Poag
Brewn	Holtham	Quigley
Clemence	Hugill	Richardson
Cox	Hull	Robb
Chegwin	Holmes	Sawyers
Carrothers	Johnston	Shortreed
Crouch	Laidlaw	Vanderwort
Connors	Milne	Wood, A. D.
Conn	MacKenzie	Wood, H. B.
Dimock	McIntyre	

Operative—

Aitken	Dickson, S. R.	McIntyre
Alcomback	Dickson, J. H.	Ott
Boyd, W. E.	Dunsmore	Oke
Bier	Flett	Pickard
Boyd, D. M.	Ferguson	Poyntz
Brown	Foley	Poag
Clemence	Holtham	Quigley
Cox	Hugill	Richardson
Chegwin	Hall	Robb
Carrothers	Holmes	Sawyers
Crouch	Johnston	Shortreed
Connors	Laidlaw	Vanderwort
Conn	Milne	Wood, A. D.
Demnick	MacKenzie	Wood, H. B.

A Great Opportunity

W. A. BLACK, M.A., D.D.S.

NEVER in its history has the dental profession of Canada been faced with such an opportunity for extending its influence, and serving its day and generation as is being presented at this time in the proposed erection of a joint medical, dental and nurses college in affiliation with the West China Union University at Chengtu, in the province of Sze Chuan, West China.

At the present time there is no dental college in China, yet three of our Canadian dentists are doing heroic service in this far distant land and it is their hope that a dental college may be established in connection with a medical school for the training of Chinese students in dentistry at this centre. These three men are Drs. Lindsay, Thompson and Mullett, all graduates of the Royal College of Dental Surgeons.

Dr. C. W. Service, who is home on furlough and who during the past year spent several months on the residence staff of the gynecological service at Johns Hopkins University, estimates that 200,000 doctors, 70,000 dentists and 400,000 nurses are required to supply China's need. He gave an address recently before the Empire Club of Toronto on "Some of China's Problems," which was much appreciated by those privileged to hear him.

Dr. Service expects to visit Canada from coast to coast and also Newfoundland in the interests of this project and it is hoped there will be a response worthy of the man and the cause. A prospectus outlining the scheme is being mailed as far as possible to every doctor, dentist and nurse. Already the nurses of Toronto have subscribed nearly \$2,000 for this object.

Shall we, as a profession, be lacking in our appreciation of a worthy cause and a great opportunity of helping our fellow practitioners in far off China? I can conceive of no greater opportunity for investment where the returns will be greater or more enduring, for we shall thus help solve China's health problems and assist in cleaning up one of the dark corners of the earth.

First Aid to the Dentist

BY HARRY RAYMOND GORDON, ST. LOUIS, MO.

IT is said that the most successful business man is the one who can pass details on to some one else. The inference is that he knows which details to pass on, and which to look after himself. Would not the same truth apply in many respects to the professional man?

Why should you be interrupted in your operating work at the

chair, merely to hear over the telephone that a patient can not keep her appointment because of a headache (which, if not imaginary, may have been caused by the milliner's failure to deliver a new hat), or to hear that some one else wants the shade of teeth changed in a plate, which is even at that moment in your vulcanizer? Surely your office assistant can explain and impress upon one just as effectively as you can that the hour was reserved especially for the one who, for a mere whim, wants to break the appointment, or that the shade of teeth can not well be changed, as requested, since the plate is now being vulcanized. In the meantime, you can be in the midst of an operation that needs your concentrated thought, and should not be neglected.

Do you enjoy the details of your bookkeeping work? Can you tell at a glance what your practice averages from month to month, and do you know the proportion your expenses bear to your cash income? Do you send monthly statements of all accounts on your ledger? And yet your office assistant can easily be trained to relieve you of all your accounting work, and you will probably discover very soon that your collections are rapidly increasing. If you haven't the time to study the fundamentals of bookkeeping, your dental depot will be more than glad to render any help needed, so that your assistant can be of real value in obtaining the monetary returns to which your knowledge and skill are entitled.

One who has been accustomed to have his office girl assist at the chair, accepts without thought the many little aids extended; but let her fail to appear some morning, and his whole thought may be why did he ever allow himself to become so dependent upon her! If he is wise—and the fact that he has an assistant proves that he is—he will then recall that the increase in his monthly practice is many times more than the salary of his assistant, and that it pays to be dependent somewhat on another.

Who keeps his bracket table and cabinet articles clean and in order? Who makes the appearance of his electric engine, switch-board, and X-ray outfit a constant credit to his office? Who is ever ready with the napkin or other article at the moment it is most needed? Whose mind has become trained to keep pace with his in planning the operation, and knows just what is wanted next?—his office assistant.

Whether you have a general practice, or specialize in orthodontia, extraction, plate-work, X-ray, or what not, an office assistant can be of inestimable value to you. If you do your own laboratory work, perhaps she would like to become more valuable to you by assisting with your models, crowns, and bridges. If you have an X-ray outfit, why not teach her to assist you in taking and developing the pictures? In that way the outfit will soon more than pay for itself without taking up practically any of your time — (*The Dental Digest*).

Home and School

*Devoted to the interests of Dental Health in
the Homes and Schools of the Community*

This Department is Edited by
F. J. CONBOY, D.D.S., Toronto
Provincial Dental Officer, Department of Education, Ontario

Dental Survey for School Children

IN Toronto the dental survey and dental education are combined, by this I mean, the pupils individually or collectively are given a short talk on teeth and their care at the time the survey is made. Those pupils found with neglected mouths are given special instruction and a powder with which to clean up. These pupils report to the examiner every morning at 9 o'clock while he remains in the school. This dental educational work adds to the time taken for survey but produces gratifying results.

The survey is made in the medical inspection room when it is centrally located. In large buildings where time would be lost by bringing pupils to this room, a suitable light corner of a hallway is chosen for the examination.

The examiner wears a white gown with pocket on right hip. This pocket is used to carry tongue depressors, which are used to hold the cheeks out or the tongue down while making the examination. On the table to the examiner's right is a paper bag to receive used tongue depressors, a glass containing lysol or some other disinfectant in which mouth mirrors and explorers are kept when not in use and a glass of clear water in which to wash them before using. Mouth mirrors and explorers are used as little as possible in making the survey.

The nurse brings four children from the class room. No. 1 is examined and defects called to the nurse who records them, patient passes on to nurse to give his name and address. No. 2 steps up for examination. It is at this point, while the nurse is engaged with No. 1, that the examiner has a chance to give No. 2 any special instruction. No. 1 is given parents' notification by the nurse and sent back to class room. On his return to class room another child is sent out. In this way there is always one child travelling between class and clinic, one with the examiner, one with the nurse, and one waiting for examination. The time taken for the survey depends entirely on the home conditions of the district, and the age of the children, an average class of forty children may be examined in from 45 minutes to

one hour. The writer usually stands when examining the older children, taking a chair for the little tots.

When making a survey without the aid of a nurse the writer usually works the tongue depressor with his left hand leaving the right free to make records. In this case the writer does not attempt to take the names of those examined but gives the child both parents' notification and school record and has him fill out both, later the school records are collected.

J. ALLAN PRIESTMAN, D.D.S.

Toronto.

* * *

Mr. L. A. Green, B.A., the Public School Inspector for Algoma district, has made a superficial dental inspection of the school children who live in those parts of his inspectorate so remote that they cannot be reached by the dentist and reports, "I find a shocking condition, an average of three decayed teeth to a pupil besides other irregularities."

* * *

In an excellent paper read before the Teachers' Institute of East Lanark and Carleton and at the request of the teachers published in the local press, Dr. M. Steele, of Carleton Place, set forth the following significant facts, "Dental Inspection and treatment means an increase in efficiency of ten per cent., an improvement in deportment of fourteen per cent., an increase in attendance of twelve per cent., a decrease in retardation of thirty per cent., and in the number of absences of forty per cent."

* * *

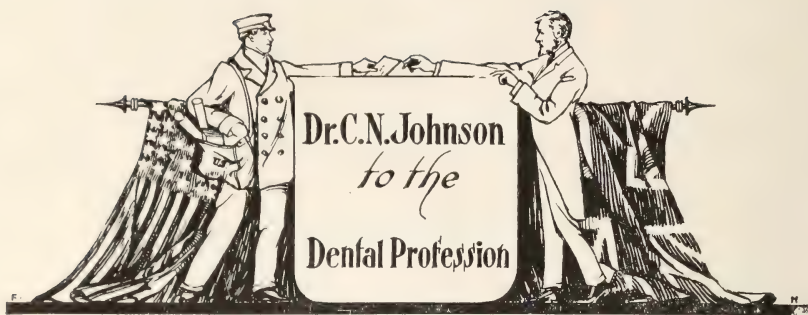
The city of London has two school dental officers, Dr. E. W. Fuller and Dr. S. A. Moore; they also have three nurses who assist in the work. The London Dental Association has volunteered to be responsible for the dental survey in the County of Middlesex. The permanent system provides regular inspection for the school children of London and the dentists are willing to go outside their own municipalities in order to help along the province-wide undertaking. This public spirited action on the part of the Association is to be highly commended.

* * *

The Ottawa Dental Society at a recent meeting passed a resolution in which they expressed their willingness to co-operate in the movement to establish permanent systems of dental inspection throughout the province.

* * *

The dentists who have incurred travelling expenses in connection with the dental survey are requested to write to Dr. Conboy for an expense form. This form must be filled out and passed by the auditor before the account can be paid.



Alberta and Her Dentists

I HAVE already mentioned the fact that my friend Dr. H. F. Whittaker, of Edmonton, made a speech at the banquet of the Saskatchewan Dental Association. Well—*What do you think?*

That man had come all the way from Edmonton—a twelve-hour journey—to accompany me from Saskatoon to Edmonton! The depth of courtesy of those men of the West can never be measured by miles or gauged by inconvenience. No trouble is too great, no expense too high, when it comes to entertaining a visitor, and I was constantly embarrassed throughout my trip by the lavishness of hospitality heaped upon me.

We arrived at Edmonton at 11 p.m., and were met at the station by Drs. Hope and Alcombrack of the Edmonton Dental Society, and driven to the home of Dr. and Mrs. Whittaker, where I was entertained during my stay in Edmonton. The next day the dentists of the society declared a holiday—think of it!—and all assembled at a given point for an automobile trip out in the country. Such a time as we had. There were about ten cars and they were decorated with two flags—the Union Jack and the Stars and Stripes. But this was not the only decoration. The cars were decorated with some of the most charming and beautiful ladies in the city of Edmonton and when I say that I am saying *something*.—We drove out into a region of the most fertile and prosperous country that ever lay under the sun, and the contrast between this and the parched areas of Northern Saskatchewan was most impressive. Great wheat fields waving and laughing up at the sunshine, every blade filled with golden treasure, and every acre filled with blades—oh, it was a sight never to be forgotten! We visited the model farm of Capt. Gillies—a farm, I was told, of 1,200 acres—where we saw some of the rarest stock in the way of horses, cattle and hogs—about 400 of the latter—and enjoyed the hospitality of this splendid gentleman. Then we drove to a grove and had a picnic and just here I am going

to record a solemn fact. There never was, since the days of Adam and Eve, another such a luncheon as was spread out for us that afternoon by the dear ladies of Edmonton. I made the remark that I felt sorry for the people in the city of Edmonton that day, because I felt sure there was not enough food left in town to sustain life after those ladies got through putting up that lunch. Each one seemed to think the others were not to bring any at all, and so she put up enough for the entire party. And then how loyally the men tried to eat it all! As soon as we could breathe at all freely again, we got in the cars and journeyed to old Fort Saskatchewan — a typical town dating back to the early days of the province. Then we drove back to Edmonton by a different route on the opposite bank of the Saskatchewan River and got to town in good time for the evening meeting; after a day such as seldom comes to a poor pilgrim whose lot is cast in the midst of a big city with nothing but stone, and brick, and mortar, and dirt, and noise, as his constant companions. I sometimes wonder if the citizens of the boundless West realize the blessings of the priceless heritage they possess.

At night we met at the Hotel MacDonald, and I was granted a privilege which was at the same time delightful and dangerous—I was told that I might talk as long as I wished. If I did not tire that audience completely out it was because of their wonderful staying qualities, but they were game to the core, and after a round that would have wearied most listeners they came up smiling. Evidently, though, they thought I must of necessity need something to moisten my mouth after so long a speech, because they presented me with a beautiful loving cup—which at once took all the talk out of me.

I found these men as I had found the Saskatchewan men, filled with the very essence of good will and generosity. I also found them well up-to-the-minute in matters pertaining to the science and art of dentistry, and it is a real joy to be permitted to meet and work with such men. If I mentioned the names of those who were particularly kind to me I would have to include the entire roster of the society. I met some of my old friends of the days long past, such as Drs. Whittaker, Alcomback, Darling, Rooney and others; and I met some whose hand I grasped for the first time, but who left such an indelible impression upon me that they will never more seem to me like strangers. All hail, to the dentists of Edmonton! They are the salt of the earth, and if I were to place any above them in my esteem it would be those dear women, their wives, who gave us such a glorious time and fed us to their hearts' content on that delightful day when we visited the Gillies' farm.

And now for Calgary. I was naturally profoundly affected when Dr. Whittaker traveled to Saskatoon to accompany me to Edmonton, and I was to get another surprise of a similar character

when I found that Dr. Callum, of Calgary, had come to Edmonton to escort me to his city. Truly the ways of these western people are beyond belief. They drop their daily duties as if they were nothing, to devote their entire time to the entertainment of a visitor as if that were everything. When we reached Calgary I found that entertainment for the day had been provided for me. After meeting my friends of the dental society I was introduced to one of Calgary's leading citizens, Mr. P. Burns, of P. Burns & Co., ranchers and packers. Mr. Burns took the party in hand and after showing us over his plant in the city we were driven out to one of his ranches at Fish Creek, about ten miles from the city. It was a ranch of 10,000 acres! Think of that, you city folks, huddled on twenty-five feet of ground! And then Mr. Burns informed me that he had another one a little farther on of 5,000 acres. And it is not leased land, but deeded land. Imagine, if you can, you city folks, one field of wheat of 1,000 acres! Ladies and gentlemen, I rise to remark that the West is a land of immensities. One feels oneself expanding, mentally and physically, in contemplation of the greatness of this wondrous country.

The ranch buildings were snuggled in a delightful valley, and Mr. Burns entertained us with the lavish hospitality of one of the barons of old. The place lured me with its never-ending charm, and I regretted the necessity of getting back to the city where I was to speak that night. I shall never forget Mr. Burns. He is a multimillionaire, yet simple in his tastes and tendencies as the humblest citizen of his city. He is a self-made man, who started at the bottom of the ladder and has climbed steadily to the top. And he is so big and well-balanced that the ascent has not made him dizzy. With all his varied interests he found time to devote an entire afternoon to the entertainment of a poor pilgrim from Chicago who had no claim upon him in the least, and who found himself at the end wholly unable to adequately express his appreciation and thanks. Long live "P. B.," as he is affectionately called by the people of Calgary. He is the best type of that splendid class of men who have made the West what it is to-day, and who are laying the foundation for what they confidently believe is to be an even greater future.

At the Palliser Hotel that night (a hotel, by the way, to compare favorably with the best of the metropolitan hotels), I had the pleasure of speaking to the members of the Calgary Dental Society. They had as guests several gentlemen outside the profession and there were also dentists from other parts of the province. I found the men of Calgary as alert and as full of professional spirit as those of other parts of the West and this is saying much. We had a splendid evening together, and not content with entertaining me most

royally they presented me at the close of the meeting with a beautiful painting of a typical Western scene—a group of Blackfeet Indians. I prize that picture beyond price, and every time I look at it I shall think of the dear boys in Calgary who gave it to me.

The following morning Dr. Leslie Wright drove to the hotel in his car, bundled me in, and we started up the mountain road to Banff. We did not start alone. We had a very charming escort in the person of Mrs. Wright, and she did not come empty-handed—she brought a lunch-basket. I sometimes thought that those dear people of the prairie provinces did little else than eat. At least they kept me at it most of the time in my waking hours, and I actually seemed to enjoy it. What a trip we had! I am always filled with awe at sight of those majestic and alluring mountains. I have often said that every individual who found it possible should take a trip up into the Canadian Rockies at least once a year for the moral effect, if for nothing else. No man of any imagination can ever think small, or mean, or envious thoughts after looking upon those mountains, and goodness knows, most of us need something of that sort to broaden us out and make us overlook the petty things of life. How much of our energy we waste fussing and fuming over the non-essentials—how much more good we could do if we kept our vision concentrated on the bigger and broader things—on the things really worth while. But hold—I surely did not start this paragraph for the purpose of moralizing—I started it to tell of the trip to Banff.

Seeing the mountains from an automobile is much better in every way than from a train, and I enjoyed it to the utmost. The majesty of those enormous peaks—some of them piercing the clouds—can never be imagined till they are once witnessed. No paragraph or painting can ever do them justice, no description can adequately portray their silent grandeur. They must be seen—they must be *felt*. Because one does actually *feel* the marvel of it all when one drives through those mountains. I breathe more deeply now every time I recall them.

We motored around the vicinity of Banff, out to Lake Minnewank, and other beauty spots, and remained over night at the big hotel at Banff. The next day we drove leisurely back to Calgary, having run in all about two hundred miles—a fitting climax to my visit to “Sunny Alberta.” At the station that night to see me off were Drs. Callum, Wright and De Renzy—solicitous to the very last minute for my comfort and welfare. I can never forget it. When I look back at the courtesy and kindness of all those men of Calgary I am actually embarrassed. As I have already said, Dr. Callum had gone all the way to Edmonton to bring me to Calgary. Dr. C. B. Johnson, President of the society, cut into his vacation up in the lake region and came to Calgary to the meeting. Dr. W. A. Piper, for-

merly of Ontario, dropped everything the moment I reached Calgary, and after that I did not even have to think for myself. Everything was arranged for me, even to my transportation back East. Then there was Dr. Robb, in whose car Mr. Burns and I were driven to the ranch, and Dr. Doyle, and Dr. Kennedy, and—but please fill in the name of every member of the society, which is the only way of making the list complete. If those men could only know how deeply appreciative I am of all their kindness, I am sure it would put a little warmer glow in their hearts—at least I hope it would.

For myself I am made a better man because of my trip to the Great North-West. There is something broadening in the very air of that country, there is something inspiring in coming in contact with the people. Really and truly they are different from the rest of us. They have imbibed that wondrous thing, *the spirit of the West*, and that spirit is something to be reckoned with. The breadth of the prairies, the majesty of the mountains, the illimitable expansions of every thing, all contribute to the generous temperament of the people. They at once take you into their hearts, and whatever is theirs is equally yours.

And the resources of the country—I wish I had time to write of these. There is coal enough in Alberta alone to warm the firesides of many generations to come. There is enough vacant land to raise grain to feed the world. There is wild game enough to furnish sport for the myriads who love the paddle and the gun. Which reminds me that all along the journey there and back—I traveled different routes—I saw countless thousands of wild duck swimming leisurely in the lakes beside the railroad track, unafraid of the roar of the train, and apparently oblivious of the danger that will come to them when the duck season opens. On the way from Edmonton to Calgary I saw them in some lakes so close to a town that I said to Dr. Callum, "It looks to me as if the people of Alberta kept wild ducks in their back yards."

And then there is another resource of the West to which I wish to pay especial tribute. No one can go to that country even for a short time without being impressed with the beauty, the graciousness, the charm, the intelligence, and the warmth of affection of the women of that land. They are spontaneous, natural, open-hearted and altogether lovable, and in summing up the wondrous assets of the country as a whole I should place easily at the head of the list the asset it possesses in its charming women.

C. H. Johnson.

MULTUM IN PARVO

This Department is Edited by

C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

SHARPENING PYORRHEA INSTRUMENTS.—Always round off the corners to avoid cutting any grooves on the roots. This is very important.—*Earle H. Thomas, Chicago, Ill., (Dental Digest).*

BUCKLEY'S DESENSITIZING PASTE.—Has anyone ever tried this paste on those extremely sensitive gingival margins where a filling is not necessary, and Ag. No. 3 is contraindicated (on account of the inevitable blackness which follows its application) and $ZnCl$ is not effective. Smear the exposed surface with the paste and seal with calxine for two days. I have had excellent results without any pulp trouble or discoloration. — *E. G. Simpson, Newcastle, (Dental Digest).*

ROOT CANAL FILLING.—The use of rosin and chloroform (Callahan) will make root canal filling material more adhesive. A good plan is to first use the rosin solution then chloro-percha, then the gutta-percha points. The two solutions are pumped to the apex with a broach. This combination shows much better in radiographs than the rosin solution and points alone. The greatest objection to gutta-percha is that it is non-germicidal and absorbent; it absorbs serum, etc., and becomes very offensive.—*McLean, (Dental Digest).*

PULP CAPPING.—This method is only recommended in cavities where the decalcified dentin overlying the pulp is in the form known as leathery decay. The decalcified dentin must be first treated with oil of cloves (the active principle of which is said to be eugenol) for at least two weeks. This both sterilizes and hardens the decalcified dentin. The dressings should be sealed in with one of the temporary cements. If all seems propitious after two to four weeks, the tooth is isolated with the rubber dam, thoroughly dry with hot air, and a paste, made of zinc oxid and oil of cloves spread over the floor of the cavity. This is covered with a concaved metallic cap, preferably of irido-platinum. This concaved cap is filled with the paste and carefully placed in the cavity, so as to bridge over the possible point of exposure of the pulp and thus serve as a protection against masticatory stress. This cap also prevents the admixture of the oil of cloves

paste with the oxyphosphate. Over this metallic cap is placed a covering of oxyphosphate cement, mixed to a dough-like consistence, and carefully packed in the cavity and against the side walls.—(*Dental Cosmos*).

TECHNIQUE OF WIRING CORRESPONDING TEETH OF SUPERIOR AND INFERIOR MAXILLAE IN FRACTURE OF INFERIOR MAXILLA.—The mouth is cleansed by irrigating with a weak hydrogen dioxid solution followed by sterile water. Clots of food may be loosened with a wooden applicator mounted with cotton. If the patient is excitable anesthesia (nitrous oxid and oxygen or ether) is required. The fracture is then reduced, and any loose teeth in the line of fracture removed. When the occlusion is correct, the teeth to be wired are selected and the jaws separated again. Six-centimeter lengths of copper wire, No. 26 or smaller, are cut, and the teeth of the superior maxilla prepared first. The upper first molar is taken, for example. The cheek is gently retracted with the finger or Parker retractor, and the wire slipped through the approximal interdental space. Each end is grasped with a clamp and the protruding ends twisted, the first twist fixing the wire around the body of the tooth, and again until six twists are made. If the two ends are grasped in one clamp and twisted, the tension from torsion snaps the wire before it clinches the tooth. The wire must be proximal to the shoulder of the tooth, and take the shape of the circumference. The remaining selected teeth are prepared in the same manner. Once the wires are in place, the inferior jaw is forced into position of correct occlusion, the wires of the corresponding teeth are twisted or hooked together, the superfluous portions cut off, and the rough ends turned against the teeth and guarded with dental wax or rubber. If the wires are properly applied, no adjustment from day to day is necessary. The wires may be removed at from the fourteenth to the twenty-first day; the longer period is advisable unless their earlier removal is deemed judicious.—*E. Butler*, (*Dental Cosmos*).

TO FIT A BACKING TO A TOOTH.—A simple, effective, and quick method for this purpose is to mark and cut holes in the backing and fit it over the pins. Press the pin side on a Faber eraser and bend the eraser up over the tooth. Place on the bench and strike the eraser with a hammer. The backing will fit well. The porcelain will not crack or check.—(*Dental Cosmos*).

CHINOSOL IN ROOT-FILLING.—Root-canal fillings which are to be radiographed will have a denser outline if chinisol is incorporated with chloro-percha, and pumped into the canal before inserting the point. Chinisol being a good antiseptic is particularly indicated in canals that have been putrescent. *Victor H. Fiqua*, (*Dental Cosmos*).

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No. 11

EDITORIAL

Dental Service in Hospitals

THE Province of Ontario is to be complimented upon the excellent Report issued by the Inspector of Hospitals and Public Charities for the Province, and particularly that phase of the Report dealing with Dental Service in Hospitals. The Inspector, Major Alex. Mackay, served during the war in the Canadian Army Medical Corps, and doubtless his experiences, during his stay in England, but confirmed his previous views regarding the need and importance of Dental Service. Major Mackay has undertaken his official duties in connection with the Hospitals of the Province with a great deal of enthusiasm since his return from overseas, and will doubtless receive the support of every citizen who learns of his good work.

The following paragraphs are taken from Major Mackay's Report, and his official attitude toward Dental Service in Hospitals will doubtless have the ultimate effect desired, namely, the organization of an efficient and adequate Dental Service in every Hospital of the Province:

"The time has arrived when every hospital throughout the Province, particularly in its larger centres, should consider the advisability of establishing a dental service in connection with the hospital. This

is considered necessary by many of the medical profession if the best interests of the hospital patients are to be served. This should be established upon the same basis as the medical and surgical service. This service could be made hygienic as well as curative. The medical profession are a unit to-day in believing that many of the ills that flesh is heir to are due to defective teeth and septic conditions in the oral cavity.

It was probably never clearly realized before the number of people who had defective teeth until we began examining recruits for overseas service. Thousands of men were rejected and this became so serious that the Militia Department opened dental clinics where these conditions were remedied and men made fit for service.

Medical inspection of schools has shown that at the initial inspection over 90 per cent. of the children have defective teeth which has a deteriorating influence on their school work besides being a menace to their health.

Many people cannot afford to pay for dental treatment and the teeth are neglected until their general health is impaired. For the deserving people of this class an outdoor dental clinic should be established in connection with the service where they could have free dental treatment. It is equally important that an adequate service should be given patients in the hospital. The various details of the service would have to be worked out according to the size and requirements of the particular community, but in any case the time is ripe for a beginning."

Obituary

DR. Allen Henry Weagant, Dental Surgeon, of Winnipeg, recently died of a severe attack of pneumonia. Dr. Weagant was a graduate of the Royal College of Dental Surgeons, and formerly practised at Smiths Falls, Ontario. He moved to Winnipeg in 1906, where he practised in association with Dr. Herbert Weagant.

The late Dr. Weagant was a veteran Oddfellow, and was a member of the Anglican Church. Dr. Weagant's many friends throughout the dental profession will be sorry to learn of his demise.

CARE OF HAND PIECES.—These two instruments are greatly abused in most offices, attention being given them only after they refuse to work. It is a good plan to place both of them in a mixture of equal parts of alcohol (ethyl) and albolene, just before leaving the office for the day. This solution will act as a lubricating and sterilizing agent.—*F. W. Frahm, (Dental Digest).*



How to Make the Most of It

“ Carry on !

H ope for speedy reconstruction !

R emember the war sufferers !

I nvoke Heaven for a lasting peace !

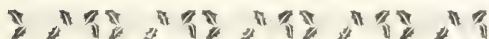
S end greeting to the Soldiers in Hospital !

T hink of future Christmases !

M ake the best of everything !

A ssist local charities !

S mile !”





THOMAS COWLING, D.D.S.
TORONTO.

Professor of Metallurgy, Associate Professor of Chemistry, Royal College of Dental Surgeons. Dr. Cowling is a regular contributor to Oral Health through the Compendium.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 9

TORONTO, DECEMBER, 1919

No. 12

Protective Measures in Dental Roentgenology

WM. A. KNOX, X-RAY OPERATOR.

THE writer has been asked by *Oral Health* to outline the dangers commonly associated with the use of the X-ray unit in dental practice.

It must be recognized that the dental X-ray unit is, as compared with a large transformer, definitely limited as to the output of useful X-ray energy and that its scope is confined, ordinarily, to roentgenology of the less dense portions of the body, such as teeth. Some manufacturers claim that, with their particular machine, it is possible to extend its use to the heavier portions of the body, such, for example, as the accessory nasal sinuses. While such a claim is true, in the limited sense, that, in the hands of an expert roentgenologist, such work may be safely done, for the average dental practitioner to attempt to do such work is to court disaster. This does not imply by any means that there are no dentists capable of using their apparatus to its fullest capabilities. There are; but they are men who have given time and application to this subject to a much fuller extent than the average dental practitioner would be willing to do.

The writer has had occasion to make an examination in the case of a woman who, a year previously, had, after repeated attempts to obtain a satisfactory roentgenogram of the nasal sinuses by means of a dental unit, suffered complete epilation with a marked, persistent dermatitis of the scalp. For six months the head was completely denuded of hair, the scalp painful, and after the lapse of a year the hair was only about one and one-half centimetres in length. The factors responsible for this deplorable result were: limited production of rays at the correct penetration, repeated exposures with consequent

absorption by the scalp of sufficient rays to produce epilation and dermatitis, and lack of experience, on the part of the operator, in the technique necessary to produce a satisfactory plate of the area X-rayed with an adequate margin of safety for the patient.

It may be noted that the damage to the tissue, exposed to continued radiation, is governed by the amount of X-ray absorption by the tissues. That is, it is not the rays passing through, but the rays absorbed by tissues, which lead to the death or injury of the cells. This fact is taken advantage of in treating malignant conditions where the effort is directed to the destruction of the abnormal cells by means of a selective bundle of rays which leave the normal healthy tissue unchanged. As comparatively a small portion of the rays, at the penetration ordinarily used in actual work, are absorbed by the superficial one to three millimetres of tissue, it is readily seen that in attempting to X-ray the heavier portions of the body with a machine whose output is limited as to X-ray quantity at the proper penetration, the factor of increased exposure necessary will in some cases expose the superficial tissue to an absorption of rays dangerously near the maximum erythema dose.

For this reason it is not good practice to X-ray repeatedly one area in an endeavor to get a satisfactory film of a tooth difficult to show properly. This practice has been a prolific cause of patients acquiring so-called X-ray burns. Much better after a reasonable number of exposures to put off further attempts for a sufficient period, say ten days to two weeks, for the appearance of a possible skin reaction. If the case be an acute one there will be a more marked tendency to repeat exposures in an endeavor to procure the information as a guide to operative relief, but such a condition must not betray the operator, however laudable may be his intentions, into producing a burn or reaction.

Every operator of an X-ray unit should make the hard and fast rule of never exposing himself to X-ray emanations. This rule should be adhered to under all circumstances. Neither should he have his assistant hold the film in the patient's mouth. An exposure of a few seconds occasionally may seem trifling, but the fact that the action of the rays is cumulative will, if this practice be persisted in, inevitably spell disaster. To look at the too long list of those whose deaths are directly attributable to cumulative X-ray action, is to realize to the fullest extent that if the human tissues are repeatedly exposed to X-ray emanations the course of the tissue degeneration is inevitable, with all its malignant sequelae. A striking example among the many is that of Dr. Walter Dodge, of Boston, who died recently after a series of skin grafts and amputations, fifty-seven in number, extending over a period of years, in an attempt to repair the ravages of chronic X-ray dermatitis. The writer has come into contact with and knows per-

sonally cases in which chronic dermatitis, malignant degeneration, amputations and malignant ulcer, with an attempt at repair by skin grafting, are the ghastly warnings to those who are inclined to treat necessity for protection lightly.

The reactions from excessive radiation extend from the mildest to the most severe types, with no clear line of demarcation between them. The mild erythema resembles closely an acute sunburn and runs much the same course, with a subsequent temporary tanning or possibly a permanent pigmentation of the skin. On the other hand the deep extensive burn is a dire calamity. The tissue may be devitalized for a considerable depth, with consequent sloughing of the destroyed tissue down to a hard fibrous base which forms the "No Man's Land" between the dead and partially destroyed tissue. This condition is excruciatingly painful; it is in fact one of the few physical states absolutely demanding morphia for the control of the pain. The aid of the surgeon is now imperative and treatment calls for dissection of the entire burned area well below the fibrous base. The convalescence is tardy, extending often over a protracted period.

The chronic dermatitis from which the operator, who constantly exposes himself, suffers, is slower in manifesting the marked symptoms. At first the skin on the part most exposed, say the hands, will become thin and crackly, the hair drops out or breaks off at the skin line and the finger nails may show a slightly striated appearance. Eventually the skin will tend to become roughened and dry and any abrasion or breaking of the surface will heal slowly with a fibrous stringy crust which, after healing, clings to the wound rather firmly. The further tendency will be to the formation of bullae which are hard and quite painful. In fact the condition is, from an earlier stage than the foregoing, increasingly painful, and an unfortunate phase of the disorder is the fact that so little can be done to allay the suffering. These bullae have a tendency to break down and form ulcers of an intractable type and from now on the aid of the surgeon is required. There have been many agents such as radium, carbon dioxide snow, ultra violet rays, ice, leucodescent lamp, high-frequency currents, etc., advocated and tried in an effort to control the degenerative changes and alleviate the pain caused thereby, but, built on past experience, the present conception of this unfortunate result of continued exposure to the X-rays is that at best there can be only palliative measures employed, with no hope of permanently arresting the disease. The foregoing is merely an attempt to outline the salient points of chronic X-ray dermatitis and represents but in small degree the many phases of this distressing malady.

If an X-ray burn be produced of the acute type, the patient must be at once referred to a physician with experience in treating lesions of this character. The affected area must not be treated as an or-

dinary burn for the tissue involved will not tolerate even the mildest emollients.

Were it possible to give a reliable formula as to the limit of safe exposure to any one area in dental roentgenology, the margin of safety as regards the patient could be definitely established. This has been worked out fairly well in treatment, but in the field of dental work the factors of tube vacuum, machine setting, and operator's technique are so variable that any attempts to outline such a formula would be only misleading.

The protection of the operator is a matter of the utmost importance. The fact that the dental unit is limited in output, compared with the large transformer, must not lead the operator into the error of thinking that with the lesser volume of X-ray energy the corresponding risk of injury through careless handling is minimized. The operator should never work with a tube unprotected by some such container as a lead glass shield, rubber hood impermeable to the rays, or a lead-lined box. He should have, for personal protection, a vertical lead screen high enough and sufficiently wide to shield the entire body. This screen must have a lead glass window. After making all adjustments as to tube and patient the operator can control the exposure protected entirely by the screen, and have at the same time a full view of the patient and apparatus through the window.

From the foregoing it must not be gathered that the operation of X-ray apparatus is a branch of physical science to be approached in fear and trembling. Such a conception would be far from true. In the hands of an intelligent operator, who has made himself familiar with the potentialities and limitations of this form of energy, the use of this aid to diagnosis is absolutely safe to both operator and patient. It may be said still further that, granted the operator will thoroughly familiarize himself with the facts governing the use of X-ray energy, he may avail himself of this most useful aid to diagnosis secure in the knowledge that no untoward effects will follow. On the other hand carelessness in the use of this form of energy will sooner or later bestow on the one responsible a most undesirable legacy. It can not be stated too strongly that the abuse of the X-ray will eventually lead to a reaction which may vary from one comparatively mild to one absolutely vicious. A further point to be noted is that the causation of a burn, except in certain treatment cases, is evidence of incompetence and is so regarded by the courts.

The voltage used to excite the X-ray tube varies from 30,000 to 50,000 volts. Voltage at this tension has various physical and chemical effects on the air of the room in which the apparatus is situated. For instance one property or action of high voltage on oxygen is to ionize this gas,—that is, the atoms are broken up into ions. This radically changes the oxygen from the form of molecule in which it is

present in the air. There are also various deleterious gases formed, a product of one of which is free nitric acid. These changes were not recognized to any extent until the system of intensive treatment was brought to its present efficiency by various physicians in the United States. It was found that patients after treatment, which lasted a considerable length of time, as the same duration was given to each port of entry, exhibited signs of distress varying from one or two hours' duration to periods much longer, accompanied with nausea and prostration. This proved to be a problem until it was found that this feature could be eliminated by providing the patient with a supply of air drawn from a source entirely isolated from the wires carrying the high voltage and the tube. While this is an extreme illustration it serves to show that where this change is going on in a lesser degree the necessity of thorough ventilation is of sufficient importance to be considered by the operator.

In conclusion the following points are worth noting:—

Do not hold or allow your assistant to hold the film in the patient's mouth.

If it is necessary to adjust the tube vacuum swing the tube away from the patient. Never subject the patient to any X-ray examination which is not necessary.

With modern dental apparatus it is never necessary for the operator to step from behind the protective screen when the tube is in operation.

Do not at the solicitation of a friend, medical or otherwise, attempt to X-ray a portion of the body unless you are absolutely certain of the technique necessary to cover that area safely.

Do not, under any circumstance, attempt treatment. This may seem superfluous, but many dental installations are in areas remote from any other X-ray plant and the tendency on the part of the resident medical man may be to ask his friend, the dentist, to try the effect of a few treatments on some case in which X-ray treatment is indicated. Compliance with his wish may result in a situation in which there is neither profit nor honor.

Continued exposure of the operator, even though productive of no evil effects, may render him sterile.

The writer, through careful observation of these factors, has, through a period of fifteen years, during which many thousands of cases were handled, not only avoided any semblance of injury to a patient, but also escaped any untoward personal effects. If the points delineated serve to guide in what must be regarded as an ever-increasing field of activity, the hope is expressed that they may, in some measure, answer until further light is shed on a science that is undoubtedly still in its infancy.

48 College Street,
Toronto.

Vancouver Dentists Honor British Columbia Colleagues Who Served in the War

THE Officers and Members of the Vancouver Dental Society tendered a banquet in honor of their professional brothers in British Columbia who served the colors in the Canadian Army Dental Corps.

A most attractive brochure announcing the banquet was issued, the cover being shaped like a flag "in the breeze" and printed in the colors of the ensign. The following is a resume of the announcement:

VANCOUVER DENTAL SOCIETY ARMY.

No. 999.—ORDERS.—BY COL. W. A. LOVERIDGE, COMMANDING.

No. 1, Assembly—The officers and members of the Vancouver Dental Society will mobilize Saturday, November 22nd, at Camp Rose du Barry (Hotel Vancouver), junction of Granville and Georgia highways, at 6 o'clock p.m.

The object of such mobilization is to pay honor, welcome home, and renew old friendships with our members who were in the service of the C.A.D.C.

No. 2, Attendance—All members of the organization, whether C.A.D.C. or not, must notify Dr. W. S. Watson, Captain of Detail, not later than November 20th, as to their certainty of being present.

The final arrangements make it necessary to observe this rule strictly.

No. 3, Absentees—All members who were in the C.A.D.C. and cannot be present in accordance with Order No. 1, and who are absent with leave, should send a brief message, to be read at Mess Saturday evening. Such communications should be sent to Lieut. George Telford, Birks Building, Vancouver, B.C.

No. 4, Messing—All members and guests will parade in the Mess at 6.30 p.m. Army rations will be dispensed with, and the Mess Committee is authorized to draw full issues of special rations, and to undertake, on behalf of the Society, full responsibility for all expense connected therewith.

No. 5, Duties—The following duties have been assigned for the evening, and will be carried out by the members named:

Mess President	Dr. W. J. Lea
Secretary	Dr. J. F. Hill

Mess Committee	Dr. T. R. Peden, Chairman
Choirmaster	Dr. T. R. Peden
Bandmaster	Dr. F. G. J. Bezeau
Mess Orderlies	{ Dr. R. L. Coldwell
	{ Dr. R. L. Pallen
	{ Dr. G. L. Plant
Rum Rations	Dr. J. M. Jones
Police	{ Dr. R. McMillan
	{ Dr. W. J. Bruce

No. 6, Membership—All members of the C.A.D.C. are notified that they are placed in good standing in the Society for 1919 and 1920, and are entitled to all the privileges that the organization affords.

J. F. HILL,

Vancouver, B.C., November 22nd, 1919.

Capt. Adjutant.

GRUB LIST.

Oysters in the Half Shell
 Consomme Julienne
 Filet of Sole, Meunier
 Roast Turkey, String Beans. Potatoes Rissoli
 Hearts of Lettuce Salade
 Coupe Jacques Petit Fours
 Demi Tasse

SCHEDULE OF AGONIES.

Toast, "The King" President
 Singing of "O Canada" Everyone
 Address of Welcome Dr. Telford
 Roll Call of Members who served the Colors in the C.A.D.C.
 Messages by those not present will be read by Dr. J. E. Black.
 Half-minute silence in honor of all dead heroes.
 Singing, "Keep the Home Fires Burning." Sung in the past with heavy hearts, but now with joy and thanksgiving.
 Reading, War Stories, Dr. W. S. Watson.
 Singing by the Quartette.
 Response to Address of Welcome and Reminiscences, by our C.A.D.C. members.
 Singing, "Pack Up Your Troubles in Your Old Kit Bag."
 Piano Solo Capt. Gee
 Singing.
 Toasts, Jokes, Stories, Gas Attacks, Air Raids, Submarine Exploits, Bombs, General Excitement, etc., etc., etc.
 Auld Lang Syne. God Save the King. Demobilization.

ROLL-CALL OF C.A.D.C. MEN IN BRITISH COLUMBIA.

R. W. Alward	W. J. Hacking	H. T. Minogue
M. C. Bagnall	J. Harper	F. H. Moore
R. C. Bamford	H. J. Henderson	F. H. Quinn
F. G. J. Bezeau	J. F. Hill	S. Redpath
A. H. L. Campbell	R. Jamieson	W. J. Rutherford
H. Clarke	W. H. Keller	J. W. N. Shepherd
W. B. Clayton	O. N. Leslie	H. A. Simmons
E. H. Crawford	T. H. Levey	W. C. Sprague
R. L. Davison	S. Little	W. K. Sproule
C. S. Dent	R. A. McAlister	E. S. Tait
L. Douglas	A. McInnes	A. J. Thomas
W. A. Fergie	A. A. McRae	E. L. Thompson
H. B. Findley	G. O. McRae	R. F. Verrinder
J. E. Gee	P. E. Margeson	A. E. Wark
W. B. Gordon	S. P. H. Marlatt	G. C. Watson
T. N. Guy	W. Mason	V. D. Wescott
	C. N. Westwood	

THE EVENING WAS A GREAT SUCCESS.

In response to the address of welcome, short speeches were made by Dr. A. E. Wark, President of the B. C. Army Dental Club; Dr. H. A. Simmons and Dr. R. Jamieson. There were also talks on "Overseas Work," by Major O. N. Leslie and Dr. E. H. Crawford, who were the first two to go over, and on "Work at Home" by Major H. T. Minogue, who organized the Dental Corps in British Columbia before going overseas.

The Diagnosis and Treatment of Oral Infections

BY ALONZO MILTON NODINE, D.D.S., NEW YORK CITY.

*Oral Surgeon and Dental Consultant, French Hospital of New York;
Late Chief Dental Officer A. R. C., Great Britain; Late
Oral and Dental Surgeon, Hopital Francais de
New York, Passy Par Veron (Yonne).*

(Read before the American Dental Club of Paris, March 11, 1919.)

AT the last meeting of the Club which I had the pleasure to attend, someone made the remark, I believe, that diagnosis is the most important part of our work. That is and at the same time is not true. Sometimes it is impossible to successfully treat a given condition without knowing what we are treating. Then at another time we may successfully treat a given condition when we do not know scientifically what we are treating. Again there are times,

did we know what we were attempting to treat, we would not make the attempt.

For a great many years we have been treating conditions about which we knew little or nothing; in so doing we have often been treating symptoms rather than the disease. When we have alleviated the symptoms we were lulled into a false security and believed we had accomplished a cure. But within the last five or six years I have noticed a change in the attitude of most of the better practitioners in the United States, not only in New York, but in the South and all parts of the country. Men are now looking for the cause of conditions, making an attempt to know what the condition is which they treat. Instead of practising empirically we are beginning to practise scientifically. We are beginning to treat the disease instead of treating the symptoms. In giving postgraduate instruction in different parts of the United States, in talking to a great many dentists, physicians, surgeons, and laymen the conclusion has been forced upon me that the reason back of this change of attitude, this awakening—I may say, this Renaissance—of dentistry, is the fact that there has been definitely established a connecting link between dentistry and medicine. The establishment of this link is due to another fact. Certain dental conditions have been found to have a most important influence on the general health of the individual. This discovery has been made possible by a more exact and definite diagnosis on the part of physicians and dentists. This more definite diagnosis is due in a large measure to the use of the X-ray. When we talk about radiographs and the X-ray to either a physician or a surgeon, or to a layman, we are talking about something for which they have a great respect and a realization of its great usefulness and value.

Each year sees the value of good dentistry increasingly appreciated. More and more the public is asking for and expecting better dental service. The importance of the dentist in health conservation is now generally recognized. Physicians and surgeons, more than ever before, are seeking the co-operation of the dentist in their efforts to discover and to cure the causes of physical ailments. The dentist is having placed upon his shoulders a great and a grave responsibility, and this responsibility cannot be ignored or shifted. He must be able to help discover the hidden causes of disease often located in the jaws and eradicate them. He must so perform dental operations that they will not become underminers of his patients' health.

THE VALUE OF THE X-RAY IN DIAGNOSIS OF DENTAL CONDITIONS

In the light of our present knowledge of the influence exerted by septic mouths, septic teeth, and septic artificial substitutes in the cause of systemic disease, it is as important for a conscientious educated dentist to use the X-ray as to use a sterilizer. The more skilful and the more careful the dentist, the more keenly he recognizes the necessity

for and the value of the X-ray. The dental surgeon is no longer concerned solely with the repair, the treatment and the replacement of the teeth. He is concerned more seriously with the patient's health and life.

Evidence accumulates with increasing rapidity that abscesses on the ends of devitalized teeth play a most important part in the cause of many cases of endocarditis, rheumatism, neuritis, nephritis, gastric ulcer, appendicitis, and other diseases, and it is only by an extensive and systematic diagnosis with the X-ray that these abscesses are discovered. Experience brings out the startling and almost unbelievable fact that about 90 per cent. of devitalized teeth have either incomplete or no root-fillings. Fully 75 per cent. of these show destruction of the bone and infection around the apical ends of roots. All such cases may be demonstrated by the radiograph. While the X-ray is of value in discovering these foci of infection, it has a still greater value when employed for the purpose of making the complete filling of most of such roots possible and certain.

We thought we could diagnose the extent of pyorrhea infections by means of our digital skill alone, but this has proved about as uncertain as has been our filling of root-canals. And the uncertainty and unsuccessfulness of this operation has been previously stated, namely, that it is only about 10 per cent. successful. Pyorrhea is an infectious focus, so that if we fail to successfully diagnose and find out the extent of the infection it is quite reasonable to believe that we may fail to successfully treat and eradicate the infection. I have seen pyorrhea treated for alveolar abscesses and alveolar abscesses treated for pyorrhea by those who did not possess an X-ray of the condition they were treating. I have seen absolutely hopeless teeth, teeth held in place by the force of gravity and a little gum tissue, being treated for pyorrhea, in which, if the proper diagnosis of the condition had been made, the dentist and the patient would have been saved the time uselessly and harmfully expended. Such efforts on the part of the dentist result in the loss of confidence on the part of the patient and perplexity and dissatisfaction on the part of the dentist. To fail to get a desired result even though we are paid for our effort is no satisfaction to us, particularly so when we realize that, had we employed a method of diagnosis available to us, we could have avoided failure. The employment of the X-ray removes the diagnosis and treatment of dental diseases, and conditions associated with them, from the realm of guesswork and doubt to that of comparative positiveness and certainty.

The X-ray clearly demonstrates that surgical operations on the teeth must be performed in a surgical manner, and when so performed and checked up by the X-ray the patient may enjoy an immunity and permanency hitherto impossible to attain.

The orthodontist, the prosthodontist, the exodontist, the oral sur-

geon, the general practitioner, each finds the X-ray of peculiar and positive value in the diagnosis and treatment of the special conditions which may come under his care. In co-operation with the physician he may employ the X-ray and interpret its findings with a knowledge and skill that the physician rarely possesses. In New York State the testimony of a physician on a dental X-ray is not competent testimony.

The X-ray not only saves the patient time and money, but what is of supreme importance, it may save his health, which is priceless. Its use establishes in the patient's mind a feeling of security and confidence.

The dentist finds in its employment an interest, a satisfaction, and a security that make possible, so far as it is within the range of his special knowledge and training, his assuming the great and grave responsibility of protecting and preserving the health of his patients. In these general terms a fair estimate of the value of the X-ray in dentistry may be described. What a searchlight and chart are to the navigator of a ship, the X-ray and radiograph are to the dentist. That captains sailed into difficult and dangerous harbors in foggy and uncertain weather without the searchlight and chart is true; that they would continue to do so without them is equally true. That dentistry was practised, and was practised well, before the use of the X-ray is true. That it perhaps would be practised well were the X-ray never used is also true, but there would not be much difference between a captain entering a dangerous harbor without a chart and searchlight at night with a valuable cargo and a dentist trying to diagnose and operate upon an obscure and uncertain case without the X-ray.

To point out that which is the greatest thing the X-ray has done for dentistry is difficult, with any degree of confidence or satisfaction to myself; nevertheless it may be most positively said that the X-ray has reformed and revolutionized dental practice. One thought comes to me with persistent insistence. The X-ray has made us practise better dentistry; the X-ray has done away, to a large extent with the "I'll do the best I can and take a chance." Now, the X-ray not only convinces us that the chances others and I took were disastrous, but it shows us something still better—we can eliminate the necessity and the temptation to take the chances we formerly took. When we did not use the X-ray, if we broke a piece of root off in extracting a tooth, we took a chance, left it in, and expected it to work out. Now we do not take that chance, because too many radiographs bear witness to the fact that a piece of root left in the jaw is dangerous practice.

When we did not use the X-ray, if we could not fill a root-canal to the end, we took a chance and filled it as far as possible, and then took another chance that it would not cause any trouble. Now, be-

cause we use the X-ray, we can fill more roots to the apex, and in the case of those we cannot fill we either extract the teeth or resect the roots. When we did not use the X-ray and certain teeth were missing or unerupted, we took two chances—one that they were not there, and the other that they were. In either case we took a chance of trouble. We might perform a useless operation, or we might neglect to perform a necessary operation. How many of us have spent a great deal of time looking for root-canals that existed only in our imagination, and how many times did we fail to fill root-canals because we did not imagine they were there! But the time uselessly expended and the potential source of trouble we left unattended to could have been saved by the employment of the X-ray.

INFLUENCE OF THE X-RAY ON ORAL SURGERY.

In the field of Oral Surgery we find the wrecks and wreckage of careless, unsanitary, septic, and sometimes almost criminal dentistry. I find almost 75 per cent. of the oral surgery I do is the result of bad dentistry. When these patients come to the oral surgeon—the court of last appeal—to save their health and perhaps their life, imagine the responsibility when perhaps the skilled efforts of all others of the healing art have given no relief! Imagine the carnage that would ensue did the oral surgeon not first have radiographs of the teeth and jaws—charts and surveys of these organs. It would seem almost impossible for oral surgery to have attained the high standard of excellence it has if the use of the X-ray had been denied it. The various conditions in which radiographs serve the oral surgeon are too numerous to mention. That the X-ray is an infallible guide no one who has taken many radiographs will for an instant maintain. Those who affect any such attitude either never have had, or have lost, the saving grace of common sense. But the more radiographs a dentist takes—and I believe that every dentist should have his own X-ray machine—the more respect he has for the radiograph, and the evidence of the radiograph, taken in conjunction with other tests, symptoms, and signs, may make his diagnosis more certain and more dependable. Further, the more radiographs a dentist takes in his daily practice, the more expert he becomes in their interpretation. By some subconscious processes he acquires an X-ray sense for interpreting the radiograph. In the practising of any technical procedure a man subconsciously acquires a highly developed sense for that procedure which at the beginning he did not possess, and which it is difficult to explain or impart to the novice. It is analogous to the secret of the successful surgeon—the ability to distinguish the sound from the unsound tissue. The ability to determine this is not acquired in a day, but comes with experience; it comes subconsciously.

The microscope and the bacteriological incubator are also important and valuable agents in diagnosis, as are all the other diagnostic

instruments, agents, and tests with which you are familiar, such as the determination of the vitality of the dental pulp by color or translucency of the tooth, the use of the ethyl-chlorid spray, a stream of ice-water or a hot instrument, the use of a mild alternating electric current, the transilluminating lamp, and the violet ray, as well as such physical signs as swelling, tenderness, pain, color, and scars, the texture and density of tissue, and the history, age, and habits of the patient. When a patient has been sent to us by a physician or surgeon to look for a focus of infection in the mouth after he has eliminated every other possible site of infection, what do we do? When I speak of physicians I also include our dental colleagues.

We may conveniently divide infections into three general classes: (1) Those infections which have their origin in the tissues that surround the tooth, which we shall for convenience call gingival infections. (2) Those infections which have their origin at the apex of devitalized or semi-devitalized teeth, which we shall call apical infections. (3) Those infections which are found in the jaw-bone proper, such as cysts, impacted or unerupted teeth, bone tumors, necrosis, foreign bodies, etc.

Whatever class of infection we may mentally catalog the patient to be suffering from in a casual examination of the mouth, we immediately want to know more, and the agent that, nine times out of ten, will give us the most complete and convincing testimony is the X-ray. The testimony that the X-ray gives us is so surprising and so convincing that often we find it necessary to back out of our snapshot or neutral diagnosis and place the condition in another or in all classes of infection. But sometimes the X-ray does not give us the information we want; sometimes the infection has not gone so far or so rapidly as to destroy the bone, and sometimes because of the technical difficulties encountered the X-ray does not give the testimony desired; then we may use the other diagnostic agents.

It is common experience to find that 90 per cent. of all devitalized teeth have incomplete or no root-canal fillings, and that 75 per cent. have radiographic evidence of infection. From this fact and for the reasons which I have previously mentioned that make this fact so important, we must, out of justice to our patients, suspect and look for devitalized teeth. The additional reasons for this I shall give later at greater length. When the X-ray does not give us the evidence we are looking for, we may use other agents to determine the vitality of the pulp, and sometimes it is necessary for us to drill into a suspected tooth. We need our dental probes, because it may be necessary to use them to discover cavities and the presence of pyorrhea pockets. In order to make a good diagnosis we must not become obsessed with the infallibility of any particular diagnostic agent, because the wider and longer experience a man has, the greater will be the caution with which he relies upon any one agent.

INFLUENCE OF ORAL INFECTIONS ON THE SYSTEM.

The important influence that oral infections exert upon the physical well-being of an individual I have but lightly touched upon. This importance cannot be passed over without calling to your attention some of the effects produced by these infections. We have all had the common experience of seeing an almost miraculous improvement in a patient's health after we have corrected some dental disorder or condition. Most of these corrections are either complete eradications or reductions in the source of infection found associated with the teeth and jaws. We have all had the common experience of seeing patients gain from ten to thirty pounds; anemic patients take on the color and bearing of perfect health; cripples walk; headaches disappear; eyesight improve; weak and nervous patients grow strong and their nervousness disappears. We have seen these improvements and cures when we knew that no other treatment was pursued and no other treatment was possible until the dental disorder was corrected. This is no academic problem; it is no mere topic of conversational dentistry, but it is a practical, everyday experience with which we are all familiar. We must naturally assume from the accumulated testimony of thousands of cases that either dental disease conditions caused or contributed to the cause of these systemic or organic maladies, or that what brought about these changes was something peculiar, and about which we are hopelessly ignorant, associated with technical processes we have used to correct these conditions. For reasons which will come out later, I am slightly biased in favor of the first proposition, namely, that dental infections are frequently the cause of systemic or organic diseases, and that in all cases dental infection is an insidious underminer of the patient's health and resistance.

EFFECTS OF ORAL INFECTIONS ON THE SYSTEM.

These infections produce their effects in several ways. Gingival infections and infections in which pus is produced and is either discharged into the mouth and swallowed or absorbed from a suppurating cavity, or cases in which the pus is discharged into the soft tissues of the face and neck, produce their effects in the following manner:

(1) The outpouring of lymph and leucocytes to combat the destructive processes of the infection is a constant drain upon the system's resisting powers. It lowers those powers in the individual so infected in two ways: (a) The individual's resistance is lowered by nature's effort to repair and combat the destructive processes in the diseased tissues. (b) The absorption of pathogenic micro-organisms and toxins from these pathological tissues also lowers the resistance of an individual otherwise in sound physical condition.

(2) Examination of the blood of patients who have marked pyorrhea and gingival infections shows a condition resembling that found in puerperal fever and advanced carcinoma.

(3) It has not as yet been recognized that micro-organisms from gingival infections produce any specific organic or systemic disease or disorder.

(4) But gingival infections among other infections from other organs and other locations are recognized as being one of the possible and common sources of infection that produce directly or indirectly or contribute to the cause of the following pathological conditions: (a) Serious, grievous, and dangerous diseases of the heart, as endocarditis, myocarditis, pericarditis, pancarditis. (b) Serious and insidious diseases of the nervous system—

(1) Indirectly: producing nutritional disturbances, anemia, and toxic states in which the nervous system suffers, as nerve exhaustion, hysteria, hypochondria, neurasthenia, psychasthenia.

(2) Directly: gingival infection has been held by some to have caused cases of (a) epilepsy, (b) bulbar paralysis, (c) lesions in the brain and spinal cord (the infection following the lymph spaces of the nerve trunks), (d) neuritis.

(5) (a) Pernicious anemia. (b) Anemias of the secondary type, including streptococcal and pneumococcal and other infections of the blood. (c) Leukemia.

(6) Chronic infections are almost invariably associated with glandular syndromes. These infections are usually focal in character and seem to occur with the same relative frequency in insufficiency of the thyroid and pituitary glands and the adrenals: (a) Thyroid intoxication. (b) Thyroid enlargement. (c) Thyroid deficiency.

(7) Nephritis.

(8) Skin diseases:

(1) Those related to joint affections: erythema nodosum; erythema multiforme; gouty eczema, psoriasis.

(2) Those neuropathic in character: lichen planus, lichen simplex (Vidal); herpes simplex; neurotic exzema; herpes zoster; alopecia areata; dermatitis herpetiformis, scleroderma; vertiligo.

(3) Those related to tuberculosis: erythema induratum; lupus erythematosus; lupus vulgaris; lichen scrofulosus.

(4) Those having some relation to anaphylaxis: eczema, urticaria, erythema multiforme, angeioneurotic edema.

(5) Miscellaneous affections: rosacea, granuloma annulare, chilblains, Raynaud's disease.

(6) The presence of gingival infections is believed in many cases to supply the material for the infections of the tonsils and throat, these sites passing on the infection to those organs, tissues, and system for which the tonsils have been held to be the infectious factor.

I believe it has not been held by anyone that focal infections or dental infections of any kind are the specific and the only cause of any definite disease or disorder. It seems to me that anyone who sets up any such absurd proposition in order to discredit and disqualify the importance of dental infections is not competent to discuss this subject in a sensible manner. The published statements of some men compel me to call your attention to this notion as applied to apical infections. Many men have been misled by the popular idea that all infections originate in pus; that unless pus is present there is no evidence of infection. Others look for the odor of putrefaction, and if no odor is present there is no infection. Others look for pain; if the patient has no pain, if the tooth is comfortable, there is no disease present; there is no infection!

The infections which cause the most trouble, the infections which are most insidious, are those which have none of these symptoms. The patient who has these infections suffers no pain or discomfort and is not conscious of any departure from the normal. The dentist also may upon casual examination discover no apparent deviation from the normal. Only when the X-ray is employed or a bacteriological examination is made is the source of infection discovered. The micro-organisms which are most dangerous—particularly the streptococcus viridans—are of so low grade and propagate so slowly in the confined walls of the alveolar bone that they set up no violent reaction, and destroy the bone so slowly or are absorbed so slowly that they give no physical discomfort. Further, these infections produce their effect so remote in time and place from their origin that the original source of the infection is frequently ignored or overlooked.

A focus of infection is a circumscribed area of tissue infected with pathogenic micro-organisms, and when located in the jaws may produce effects upon different organs and systems of the body.

These effects may be produced in four ways:

(1) By so lowering the systemic resistance that an invasion of another micro-organic host may establish a more serious infection.

(2) By the absorption of toxins.

(3) By the transfer of the micro-organisms to some organ or system whose resistance has been reduced.

(4) By metastatic emboli of clumped micro-organisms which have become detached from some focus. The most common effects of focal infections located in the jaws, together with focal infections located in other parts of the body are: Thyroid deficiency, infectious arthritis, leukemia, myositis, neuritis, goiter, asthma, nephritis, anemia, pernicious anemia, toxic hepatopathy, gastric and duodenal ulcer, appendicitis, cholecystitis, endocarditis, myocarditis, pancarditis, hypertension, arterio-neuritis, acute mania, melancholia, dementia praecox, hysteria major, neurasthenia, psychasthenia, epilepsy, lesions

of the brain and spinal cord, bulbar paralysis.

Focal infections located in the jaws about the apices of diseased teeth have also been the cause of infections in the eye, ear, nose and accessory sinuses. Most of the effects that have been previously ascribed to gingival infections may also be caused by apical infections in a more certain and insidious way, because the infection is pent up in the jaw-bone, causing absorption and distribution which is constant. On the jaw the infections produce—

(1) Gradual destruction of the bone, which may extend to such a degree as to destroy the vitality of one or several teeth.

(2) Production of cysts which by extension may invade the nose or maxillary sinus.

(3) Cysts may so weaken the lower jaw as to produce pathological fracture.

(4) The chronic irritation of their pathological contents may result in malignancy.

(5) Infection of the glands of the neck.

STERILIZATION OF ROOT-CANALS.

What are we to do with these local infections connected with devitalized teeth—those infections which originate in diseased or devitalized pulps? From the experiments of Lieut.-Col. Kenneth Taylor in Paris, on sterilization of infected bone or sequestra, he found that “The persistence of bacteria for such a long period within the bone is probably due to the mechanical protection afforded by the dense structure of the bone itself for the organisms present within the spaces and the canaliculi. They are protected from the body fluids and phagocytic cells. Leucocytes were rarely seen within the bone in any of the sequestra sectioned. Furthermore, the bacteria are protected from any antiseptic which may be introduced into the wound. A few attempts to sterilize bone sequestra *in vitro* by strong antiseptics were sufficient to demonstrate the improbability of accomplishing this result within the wound. Small splinters of only a few millimeters in diameter may be soaked in alcohol 75 per cent., hydrogen dioxide, Dakin's solution, bichlorid of mercury 1:10,000, 5 per cent. carbolic acid, or tincture of iodine, for half an hour or more, and a good growth of organisms obtained after breaking and re-sowing the splintered bone into a suitable medium.”

Professor Latham of Chicago and Dr. Price of Cleveland state that from experiments carried out by them they had found it practically impossible to sterilize infected root-canals, and further that sterile root-canals could be kept sterile not more than a few hours. For anyone who believes he can sterilize and keep sterile a root-canal, the following experiment is suggested: After completing whatever method of sterilization you may use, seal in the root-canal some sterile cotton for from twelve to twenty-four hours. Then remove the cotton

and make bacterial cultures in different media. The result will be most surprising.

From these experiments, from my own research, and from the common experience of myself and others, I am led to believe that every devitalized tooth is a septic tooth. It is septic because the density of the tooth prevents the penetration of antiseptics, while its tubular structure also allows the penetration of bacteria from the denuded apical area. There is not in a devitalized tooth that ebb and flow of living fluid in the tubules and there is not that replacement of dead and worn-out substance in the tooth with new and healthy material. The tooth is unable to maintain that natural resistance to the encroachment of disease and infection which a healthy vital tooth possesses. A tooth having a healthy pulp with its intact bloodvessels and lymphatics is capable of having its infection washed away and of having its infection overcome. The infection which even a healthy pulp is able to overcome, I believe, must be very small and not pyogenic. Any marked deviation from the normal healthy condition causes the pulp to succumb because of the peculiar structure of the tooth and the conditions which surround the pulp.

If the conclusions of our subsidized investigators and the experience and experiments of scientific men are correct, we are confronted with this problem: What are we going to do with teeth which have been intentionally devitalized, accidentally devitalized, or pathologically devitalized? Pyorrhea presents no such problem. Because I believe all that I have said to be true, I am not shutting my eyes to some other important facts which you have been thinking about as well as myself, viz:

(1) The smaller the amount or the smaller the dose of infection that is introduced into the system, the more quickly and more ably are the system's resisting forces able to overcome and neutralize that infection.

(2) The resisting powers of the healthy individual are able to overcome a limited amount of continuous infection. What that limited amount is, and what particular infections it is able to continually overcome, I do not know that anyone has had the assurance to state. Please bear in mind that I am speaking of the so-called apparently healthy individual—such an individual as when examined by a skilful physician will be put in class A.

(3) We also have the consoling thought that the radiograph has also revealed that in those teeth in which the root-canals are filled to or slightly beyond the apex—so filled that there is no space between the walls of the canal and the root-canal filling so far as radiograph evidence is concerned—instead of there being 75 per cent. of these teeth showing bone destruction at the apex, as in the case of those teeth with incomplete or no root-canal fillings, we find that less than 10 per cent. have this destruction.

(4) In those cases in which prior to filling the tooth there existed an apical infection, I believe if we surgically remove that infected root-end and the infected tissue surrounding the apex of the tooth we shall reduce the infectibility of that tooth a very great deal.

(5) The more care we exercise in removing from a root-canal infected material and the remains of the pulp, the less amount of infection we introduce into that canal, and the more solidly and completely we fill that canal, the more shall we minimize and neutralize the infecting power of the tooth.

(6) I also believe the less the number of devitalized teeth, even if perfectly filled, a healthy person possesses, the longer and the more surely will that person preserve his health.

(7) When we are treating a patient whose health is subnormal, who has any systemic or organic disease, an entirely different proposition confronts us, and the quicker and more completely we eliminate from the mouth any active or potential source of infection the better, even if we destroy our patient's hopes of having a beautiful piece of septic bridge work placed in the mouth. And when we attempt to eliminate the source of infection, whether in a healthy or sick patient, or whether it be a pyorrhea pocket, an impacted third molar, a dental cyst, or an apical infection, I believe we should eliminate it. I believe it should be done in a careful, thorough, and surgical manner. The more careful, thorough, and complete has been the technique employed, the more certain, enduring, and satisfactory have been my results.

When we are confronted with a pyorrhea pocket, or a series of pockets, the pocket is removed, obliterated along with the adjacent infected tissues, whether bone or soft tissue, and this is done under an anesthetic in a surgical manner. The results amply justify the means. When we are dealing with an impacted third molar we remove it surgically and treat the condition surgically. It is better to take the time to carefully remove the bone that is detaining the tooth rather than forcibly extract the tooth and fracture the jaw.

When we are dealing with a dental cyst, we remove the diseased bone and tissue surgically and treat the condition surgically, and we get the happy results which we anticipate. When we are dealing with an infected apical root-end, we eliminate that in a surgical manner and treat the condition in a surgical manner. Such cases as I have mentioned are largely surgical cases, and along with our surgical treatment there are other conditions to correct which are corrected in the manner which has proved most successful with us. Excepting the prevention of, and the preservation of the teeth and the tissues of the mouth from the conditions that have been mentioned, I very sincerely believe this to be the most important matter that confronts the dental profession to-day.

CONCLUSIONS.

(1) The dental profession has been raised to a higher plane by the establishment of the fact that oral infections have a positive effect on the health of the individual.

(2) The establishment of this fact is due largely to a more exact diagnosis by the use of the X-ray employed to discover these infections.

(3) The public is demanding better dentistry and is placing its confidence in the dentist who employs the X-ray and other diagnostic agents to discover these infections.

(4) The dentist should so practise his profession or employ such methods as will obviate the possibility of the teeth and tissues upon which these methods are practised becoming foci of infection.

(5) When these infections are discovered they must be eradicated in a careful, complete, and surgical manner.

(6) The present and future health of a patient must be preserved regardless of the fact that teeth may be sacrificed to do so.

(7) The prevention of the conditions which make possible these focal infections is the highest form of service a dentist may render. He may be able to restore only in an incomplete functional manner.—8 W. 40th St., New York City.—*Dental Cosmos*.

The Signature of the Blind

DR. HENRI BOUQUET, of Paris, writing upon the subject of the "Signature of the Blind," says:

"In times gone by I knew a blind man who was mayor of his commune. Fortunately for him he had a devoted wife who assisted him in his delicate task, but it always seemed to me to be a bit risky that functions of this sort should be discharged by a man whose vision is defective. Those who assist him, should their interests incline them to acts of dishonesty, may misread what he is asked to sign and, on the other hand, what confidence can we have in a signature which could easily be imitated unknown to the supposed signatory, which for that matter is rarely the same twice following. More than this, there are persons suffering from congenital blindness who cannot sign at all since ordinary writing is beyond them. Yet, according to law, blindness does not entail legal incapacity. A blind man can make a will, he can sign important documents, he can administer his fortune, indeed, as I have pointed out, he may even administer the public fortune, at any rate within certain limits. It is therefore indispensable for him to be possessed of a means of attesting that it is really he who has affixed his signature at the bottom of this or that document, it is absolutely necessary that we should have in this name, this variable, hesitating writing, or the raised characters of the Braille system, a confidence as absolute as if it were the act

of a person with normal vision. The problem is a difficult one, but the solution appears to have been discovered by Mr. Ferrier.

"Our system of judicial identification, hitherto reserved for criminals, comprises a test which has never been challenged, viz., the finger print. In view of the fact that there are not two persons in the world in whom the minute prominences of the skin that form such curious arabesques on the tips of the fingers are exactly similar; persons whom it is wished to identify are requested to place the finger tip (usually the index finger) on an inked pad and thence on to a sheet of white paper. In this way a clear reproduction of the afore-said arabesques is obtained. Here then, we have a very personal signature differing from every other signature, one moreover which no one can imitate. We are familiar with the services that this investigation yields in justice all over the world. A highly ingenious system of classification, due to Mr. Bertillon, enables us to pick out of a collection of such finger prints the one corresponding to that before us. When the individual whose identity is in question has been through the test before, he is certain to be recognized. In the same way it often happens that a valuable clue is provided by traces left on objects by burglars' finger tips, though with the advance of science, experienced criminals have adopted the use of rubber gloves in order to obviate this source of danger for them. Why then should the blind not be allowed to avail themselves of this certain, inimitable, invariable signature?

"It would be simple enough to put into practice. The blind subject could sign as he pleased, he could repeat his former signature if he has ever been able to see, he could write his name in dots if he does not happen to be acquainted with Braille's ingenious system. And side by side with this signature, be it what it may, he would affix the imprint of his right and left index fingers. Thereupon all uncertainty would disappear and we could place entire confidence in this signature which only one man in the world could have printed.

"Is there any possible objection to this suggestion? I have heard of one of the sentimental sort so that it is not of much importance. Here, it has been remarked, is a procedure that has never been employed except to identify robbers or murderers. It seems hard to inflict it upon honest persons whose only shortcoming is that of being infirm. So you see that the objection has no great weight. Moreover, it falls of itself seeing that for some time past this procedure has been adopted in the army for recruiting purposes. On the Register and on the military livret young soldiers are instructed to affix a print of their finger tips. The idea is much the same as that of applying the method to the blind. Consequently, no objection can be raised on this score since, as Mr. Ferrier himself points out, the procedure has been, so to speak, rehabilitated, which for that matter could well have been dispensed with."

Home and School

*Devoted to the interests of Dental Health in
the Homes and Schools of the Community*

This Department is Edited by

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IN an excellent paper read before the Dundas County Teachers' Association, by Dr. Will C. Davey, of Morrisburg, he uses the following significant quotation from Prof. Russell H. Chittenden, of Yale University: "A proper physiological condition begets a moral, mental and physical fitness which cannot be attained in any other way. Further, it must be remembered that lack of a proper physiological condition of body is more broadly responsible for moral, social, mental and physical ills than any other factor that can be named. Poverty and vice on ultimate analysis may often be traced to a perversion of nutrition. A healthy state of the body is a necessary concomitant of mental and moral vigor as well as of physical strength. Abnormal methods of living are often the accompaniment or forerunner of vicious tastes that might never have been developed under more strictly physiological conditions. Health, strength (mental and physical) and moral tone alike depend upon the proper fulfilment of the laws of nature and it is the manifest duty of a people, hoping for the fullest development of physical, mental and moral strength, to ascertain the character of these laws with a view to their proper observance. Poverty, crime, physical ills or perverted moral sense are the penalties we may be called upon to pay for the disobedience of nature's laws; penalties which not only we may have to pay but which may be passed down to succeeding generations, thereby influencing the lives of those yet unborn."

The greatest menace to a proper physiological condition are the oral diseases. Oral diseases can be prevented by regular dental inspection and treatment.

* * *

The first report of the dental survey came from the dentists of the inspectorate of Leeds and Grenville No. 1. In this report from the dentists of Ganonoque, Dr. Mabey states that of the first two hundred and eighty-three children examined, more than ninety-five per cent. needed dental attention.

Dr. McMillan, the school dentist for Windsor and Walkerville, has just completed his survey and reports that he found four thousand, two hundred and twenty-two first permanent molars decayed and eight hundred and forty-nine that must be extracted. In his letter, which accompanies the report, he states that upon a more thorough examination than that possible at a school survey, a much larger number will be found to have gone beyond repair. Of four thousand, six hundred and three public and high school pupils there were four thousand and five in urgent need of dental attention.

* * *

The reports sent into this department by school inspectors and nurses indicate that in a considerable number of our towns the dentist or dentists practising there are not able, through pressure of work, to supply the dental attention which the people need. There is nothing more depressing to a dentist than to be convinced that, work as hard as he may, he cannot perform the tasks which crowd upon him. There is nothing more unfair or unjust to a patient than to postpone and postpone a dental operation which should receive immediate attention. In many of our towns there is an opening for another dentist, in some cases a recent graduate might be kept quite busy attending to the dental needs of the children, the boys and girls who are now so cruelly neglected. While it is a great mistake to have in any town more dentists than can be kept employed, it is a still greater calamity to have so few men that dental service urgently needed cannot be rendered.

* * *

At the conclusion of the present term, one hundred and thirty graduates will be deciding where they are to begin their life work—their service to humanity. Would it not be exceedingly helpful to these young men, beneficial to the profession, and a blessing to the public, if the members of the profession who know of a good opening either in their own town or an adjoining one where there is no dentist, would write to this department or to the College? We would see that the information was forwarded to some worthy graduate.

TAKING IMPRESSIONS IN PERSONS WHO HAVE WORN PLATES BEFORE.—It has been observed that, after a person has worn a plate, especially one of vulcanite, for some time, the mucous membrane swells slightly. This is the reason why new plates often do not fit satisfactorily in such cases. As the mucous membrane returns to normal condition within twenty-four hours if no plate is worn, the patient should be requested to go without a plate for that length of time before a new impression is taken.—*La Odontologia Colombiana.*

First Aid to the Dentist

YOUR busy patient, calling when you are out to lunch, or perhaps keeping a business engagement, will appreciate the appearance of an office assistant far more than a lifeless room or a conundrum, such as "back in a few minutes," or "will return at 2 p.m." when it is then two-thirty.

To be represented in your office at all times either by yourself or your assistant, creates an impression of permanency, system, and thoughtfulness.

Many of your patients are more or less nervous, and under a strain while waiting for their call. It is strange how quickly a pleasant nod or two, or perhaps a smile, from your assistant, will break the tension, and bring your patient into a much better attitude when called to the chair.

During the operation, the fact that your assistant keeps you from being disturbed every few minutes by the telephone or callers, is certainly appreciated by your patient, who feels safer if you are constantly at the chair. One's imagination works quickly, and to the patient, all sorts of disastrous things seem about to happen, when you turn away. The fact that they never happen doesn't decrease the nervous strain. The less excitement your patient goes through, the greater will be her loyalty; and an office assistant is more than a little help in the right direction.

BROADENING YOUR OUTLOOK.

An office assistant changes the mental atmosphere of an office. For patient and dentist alike, there is apt to come unconsciously a little more thoughtfulness and sympathy for others, and a little more appreciation for the things that count.

An office girl, without appearing forward or familiar, can often obtain, from conversation between patients or through remarks made direct to her, information that may prove valuable to her dentist in more ways than one, and may result to the benefit of the patient as well. There is no doubt that the more the dentist understands his patient, the broader will be his outlook, and the better will be his service.

To obtain the greatest benefit from your assistant, help her to enjoy her work. Show her why a certain thing is done, and invite suggestions as to the changes that might improve the office. If you are practising in a city in which a dental depot is located, let her visit there occasionally. She will be welcomed in any department, and be given gladly any information she might desire. Don't begrudge the time she spends in reading your dental journals. The more interest she shows in your profession, the better investment she will prove to be; and you will find that you can not afford to be without her. She is first aid to the dentist.—(*The Dental Digest*).

MULTUM IN PARVO

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HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

TO CONFINE SOLDER TO ONE SPOT.—Paint the parts to be protected with yellow ochre water-colour. Whiting will work the same way, but flakes off when heat is applied, which is not the case with the yellow ochre.

TO GIVE A FINE POLISH TO GOLD.—After scratches have been removed with pumice, nothing is so effective as oxide of zinc on a brush wheel. It leaves a beautiful lustrous polish.

EXTRACTING UPPER CANINES.—Sometimes these are very difficult to extract. When removing the upper teeth for a plate, remove the teeth on either side of the canine and grasp the latter at the sides—the forceps will not slip and the tooth is easily removed.

CUTTING UP SOLDER.—Solder should be used in as large pieces as can be put on the work. One or two pieces the right size for a crown will give better results than numerous small pieces. The reason for this is that oxide on a large piece is much less in proportion to bulk than the skin on a small piece, and the weight of the larger portion will break the skin easier. Again less borax is necessary, and the lesser the borax used the better, provided enough is used.

DISEASED PULPS.—Diseased pulps give rise to our greatest problems. Whatever the evidence given by the radiograph, we may be sure that opening the pulp chamber results in a discharge of foul gas and pus. The condition must be met with surgical procedure.—*John E. Nyman, (Dental Cosmos).*

EFFECTIVE METHOD OF REMOVING A BROKEN REAMER OR BUR FROM A ROOT.—The following is a simple method for removing a reamer or bur broken and lodged in the recesses of a root canal: Two thin but stiff nerve broaches are set into a broach-holder and passed into the root one on each side of the broken reamer. If the latter hugs the root walls too firmly a small round bur is used until the broaches can be passed between the fractured bur and the root walls. The broaches are then twisted around the obstinate fragment. The operation may not be successful in the first few attempts, but anyone who tries this method will be agreeably surprised to find how firm a grip the broaches take on the broken bur.—*Dental Outlook.*



The Mistletoe and Holly

I AM sorry for the man or woman who ever gets too old to enter into the spirit of the blessed Yuletide Season, or who sees nothing beautiful in the sentiment which yearly springs up in the hearts of people to bind them closer in a common sympathy. There is something about Christmas time which appeals to the finer senses of humanity and makes it forget for the moment the sordid side of life and the other while unconquerable greed of gain. And when this sentiment is summed up it will be found that aside from religious convictions, it revolves for the most part around two ideas—the idea of home and the idea of childhood. And what is better than these two ideas? Home is the most sacred place on earth, and childhood is the sweetest and purest thing in existence.

At Christmas time there is the universal home-coming on the part of the loved ones scattered here and there by the exigencies of modern life, and then to gather once again around the old fireside and see reflected in the light of the glowing embers from the ancient Yule-log the faces of those best beloved is the sweetest sight this side the pearly gates.

And the children—who among us is not made better by the radiant faces of the blessed little tots as they hug close the burnished toys and chatter so confidently of their patron saint, the dear, immortal old Kriss Kringle? And who can escape the contagion of their happiness? Pity the man who is proof against this sort of infection, and who can look unmoved upon such a scene as this. Let us get closer together at this time of the year, and let us cherish more and more the beautiful sentiment typified by the event. Let us try, if we may, to divorce Christmas from the modern idea of a scramble for presents, and let us exchange love for love, and charity for charity, instead of bartering so fervently in material commodities on this especial occasion. Let us go back to the sentiment of home and childhood and renew the memories of other days when life was less complex and not so careworn as it is to-day. Let us be simple in our tastes and happy in their fulfilment. A Merry Christmas and a Happy New Year to all.

C. N. JOHNSON.

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EDITORIAL

Greeting, 1919-1920

To one and all, The Old, Old Wish, a Merry Christmas and a Happy New Year.

How the years do roll around and as we get older they seem to roll the faster. To the Editor, it seems almost incredible that January, 1920, will introduce the tenth year of publication of Oral Health. But such is the case.

The Editor desires to sincerely thank all those who have made the ninth volume of the magazine possible, by contributions or otherwise. Particularly do we remember, with gratitude, those who have regularly undertaken editorial duties during the year.

The Editor values the friendships that have been formed because of the journal, and the many personal messages received from readers whose hands he has never grasped, and who, though thousands of miles distant, are nevertheless, in spirit, very close indeed.

Oral Health originated as somewhat of a "hobby," by which the Editor was able to engage in a pleasant diversion from the daily grind of life, and the magazine has remained as such to the present time. We must confess, however, that what seemed in the early days a sort of monthly frolic, has become a much more serious task, and we wonder whether this changed attitude is to be accounted for by way of added years, or whether the heavier stress of the war

period has had a tendency to crowd our "hobbies" to the wall as being numbered among the things that are less essential. And yet, in spite of everything, the joy of magazine work remains throughout the years. May the year Nineteen-Twenty be a year of great achievement and unselfish service for us all.

Alumni Society of Dewey School of Orthodontia

THE next annual meeting of this society will be held on April 1, 2 and 3, 1920, at the Edgewater Beach Hotel in Chicago.

The usual high standard of the meetings of this Society will be maintained. One half day will be devoted to clinics.

All interested in Orthodontia are cordially invited to attend these meetings.

GEORGE F. BURKE, Secretary.

741-43 David Whitney Bldg. Detroit, Michigan.

Personal Sketches of Canadian Dentists Who Served in the War



CAPT. E. A. GRANT was an Army Dental Surgeon, attached to the C.A.M.C. before the war, and was one of the five Dental Officers in charge of the first large Army Dental Clinic in Canada, which with the aid of civilian Dentists of Toronto, was carried on at Exhibition Camp in the winter of 1914-15. The success of this Clinic played a considerable part in obtaining sanction for the formation of the Canadian Army Dental Corps.

In June, 1915, Capt. Grant was appointed Officer-in-Charge of Dental Services at Valcartier Camp and proceeded to England in December, 1915, with the second draft of the C.A.D.C., where he was posted to Bramshott, being Senior Dental Officer there till Aug., 1916, when he went to France with the 4th Canadian Division, attached to the Eleventh Field Ambulance.

He served with the 4th Division during its whole period of service in France until its demobilization in England in May, 1919, was mentioned in Sir Douglas Haig's dispatches of Nov. 8th, 1918, and received his discharge June 9th, 1919.

Capt. Grant is a member of the Faculty of the Royal College of Dental Surgeons and has resumed civilian practice in Toronto.

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